

ITEMS OF INTEREST.

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Shots from the Profession.

ANESTHETICS FROM A CHEMICAL AND PHYSIOLOGICAL POINT OF VIEW.

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Anesthesia is the most precious gift of science to man. The elixir of life and the fountain of eternal youth will never be discovered, but the diminution of suffering is fortunately attainable. It has been well said that in the days before the introduction of anesthetics "surgery was agony."

Very few of us can realize the scenes of the operating room of fifty years ago, or contrast the spectacle of a patient bound to the operating table, conscious of every movement of the knife or forceps, with the present method, under which the patient tranquilly sleeps, even during the most formidable operations known to surgery.

The number of substances used for the production of general anesthesia is quite large. Till recently the method of producing anesthesia was only by inhalation; we can now produce it per rectum, and though perhaps objectionable and even dangerous, the results obtained show that the effects of the anesthetics are caused by its absorption into the blood, and not to mere influence on the respiratory tract. Leaving out of consideration nitrous oxide, the general anesthetics consist of volatile liquids, derived from the hydro-carbons, particularly of those low in the series. Many are unsuitable either on account of their slowness of action, disagreeable properties, difficulty of preparation, or other causes. The experience of the surgeons of this country has been practically limited to three substances,—ethyl oxide, commonly called ether; trichlormethane, commonly called chloroform; and ethyl bromide. In their physiological action these bodies are all cardiac depressants, chloroform being the most so. The continuation of life requires the maintenance of the functions of the heart, lungs, and central nervous system. Anesthetics attack all three

points, depressing the heart power, disturbing the osmotic processes of respiration, and, by poisoning the blood current, affecting the brain. Notwithstanding this, when used cautiously, they may be safely employed. Chloroform is undoubtedly the most energetic. Nothing is more regretful in the history of our profession than the deaths from chloroform administered by physicians and dentists. Too much stress cannot be laid on the fact that the heart power is so seriously reduced by it that it is incapable of supplying the brain properly unless the patient is entirely recumbent. We know, of course, nothing about the intimate action of these agents, and the relative danger is only, therefore, a matter of clinical experience; and on this topic much difference of opinion prevails. In this city, for instance, are surgeons who rarely use ether, and those who never use chloroform. We may get a suggestion concerning the physiological anesthetics from facts recently derived from intoxicating agents, which are somewhat analogous bodies. It is well known, for instance, that the term alcohol, long restricted to the product of ordinary fermentation has now acquired a generic meaning, and includes many bodies, some closely resembling common alcohol, and others very different. Without stepping too far into the field of chemistry proper, I may say there are several series of these alcohols, of the first and simplest of which, common alcohol, is the second member. Each of these series consist of analogous bodies, presenting gradually increasing complexity of structure, but never departing from a certain type. The chemist recognizes in each alcohol an arrangement of atoms into a radicle characteristic of the alcohol and all its derivatives. The radicles and the alcohols which contain them may be arranged so as to show a regular increase of carbon atoms in the order of the numbers, one, two, etc. Now, the researches of Richardson, Rabateau, and others have shown, I think conclusively that the physiological action increases in intensity and danger as the number of carbon atoms increase, so that while wood spirit (methyl alcohol), with but a single atom of carbon, is transient and slight in its effects, those of fusel oil (pentyl alcohol), which has five atoms of carbon, are prolonged and severe. It would be a mere speculation, but still I think not an unreasonable one, to suppose that a part of this difference is caused by the lower osmotic power and greater difficulty of oxidation in the pentyl alcohol, these being the two methods by which the system gets rid of injurious matters. Much of the physiological action depends on the presence of particular radicles, as Rabateau claims to have proved by the fact that two such bodies as pentyl formate and methyl valerate, which have the same composition, will produce very different action, one the comparatively harmless methyl alcohol, and the other the harmful fusel oil.

Now, it does not seem too violent to apply these facts to our common anesthetics. Nitrous oxide is a substance as near to air in composition as any compound could be. It is highly diffusible, soluble in water, and, as experiment will easily show, capable of acting as a supporter of combustion. The functions of respiration and excretion are therefore, not much taxed by it. It may subserve slightly the purpose of the air which it replaces in the lungs. Ether is a very different substance; its action is more specific, but it is highly combustible,—as much so as alcohol,—and it is therefore quickly and rapidly oxidized, and the result of such oxidation is simply carbonic acid products, to which the blood and lungs are accustomed. As the complexity of the hydro-carbon radicles increases the combustibility decreases, and hence the greater difficulty that the blood has in getting rid of the substance. When, however, we introduce into these organic substances elements which are thoroughly foreign to the processes of nutrition, we get more severe results. Modern organic chemistry has given us extended lists of substances perfectly definite in character, analogous to the true organic bodies, but apparently not only incapable of forming a part of healthy tissues, but inimical to life. We have, for instance, the substitutive compounds of chlorine, bromine, iodine, nitrogen dioxide, arsenic, antimony, and mercury. One has only to recall the effect of chloral, iodoform, hydrogen arsenide, and nitro-glycerin, and contrast them with the original organic bodies from which they are derived and to which they are related, to see how the new elements added have increased their toxic action. Here it seems to me we have a clew to the marked action of such anesthetics as chloroform, methane dichloride, ethyl bromide, and carbon tetrachloride. Not only are these bodies difficult to break up (chloroform, for instance, will not yield its chlorine even to silver nitrate), but when broken up the halogen must either be set free or converted into an active form of combination. Observations as to the relative danger of anesthetics, of closely allied character, are not entirely reliable, but one of the most recent essays on the subject treating of the bodies produced by the successive substitution of chlorine for hydrogen, ascribes the most dangerous and prolonged action to the one containing the most chlorine.

If the principle here advocated is correct,—that the danger of an anesthetic will be directly as its slowness of oxidation and osmosis, and the presence in it of elements foreign to the typical organic bodies,—we will have indications as to the directions which our researches for new agents should take.

In the use of these agents, of course, the physiological action may be controlled by the manner of administration. I have already referred to the danger of using chloroform in the upright position. It

is also important to notice that, unless proper care is taken, we may add the dangers of asphyxia to those of anesthesia. A plentiful supply of air is imperatively necessary with chloroform, and the fact that air can be freely admitted without interfering with the effect is one of the reasons that chloroform is in favor. Ether, on the other hand, will not act unless air be pretty well excluded. Many operators fail to get good results from ether, and give it up because, as they say, they cannot get the patient quiet. Most of those who use ether successfully are in the habit of keeping the towel or inhaler close to the patient's mouth, and by this means the preliminary intoxicating stage is passed. Other surgeons prefer to use ether first very lightly mixed with air, till the sensibility of the laryngeal mucous membrane is obtunded. In this way coughing is prevented. I have been under the influence of ether by both methods, and I must say I prefer the latter. The ether was given to me successfully, and the recovery from the effect was rapid and perfect. By the other method I was so completely prostrated that it was several hours before I could leave the operating room, and I am sure (though I could not have believed it had any one else told me) that the odor of ether was perceptible to me in my own head for more than twenty-four hours after administration.

In relation to the condition of the kidney, it appears that in marked kidney disease, particularly in the now too common Bright's disease, anesthetics are more than usually dangerous. Ether is specially obnoxious, and I have heard an experienced obstetrician say that he had abandoned its use in producing anesthesia in labor, using chloroform entirely. I do not know that it is possible to explain the specific danger from ether in these cases, but it is probably connected with the manner in which the ether is excreted. At any rate, it is now considered proper surgery to test the urine before using any of the stronger anesthetics.—[Odontological Society of Pennsylvania, in *Cosmos*.]

The Welch Dental Company have rendered an important service to the homes of the nation by the publication of a brochure entitled "*Letters from a Mother to a Mother on Children's Teeth*." The author whose initials only are given, "M. W. J.," in the most straightforward and scientific way unfolds her theories, which have the force of logic, and the self-evident plausibility of good common sense to give them sanction, and commend them to confidence.—*Ocean Grove Record*.

For Sun Burn, Freckles, etc.—Powdered borax, six drams, pure glycerine $\frac{3}{4}$ ounce, rose water or elder flower water 12 ounces; mix. Its daily use as a cosmetic wash renders the skin beautifully soft and white, and prevents and removes chaps, sun burns, etc.

EFFECT OF DISEASED TEETH ON THE EAR.

HENRY C. HAUGHTON, M. D.

[In New York Odontological Society.]

In the New York University I was associated with Dr. Rossa, and since 1868 I have been connected with the New York Ophthalmic Hospital, at the corner of Twenty-third street and Third avenue. In these years my attention has been forced unceasingly to the fact that there is a relation between dental conditions and trophic changes in the ear; but to say that in every case where there are carious teeth there is necessarily a neuralgic condition, or trophic changes going on, seems not to be sustained by the facts. That there are facts pointing to such relations in many cases every careful observer must acknowledge. My own observation, in adults particularly, is that live teeth, improperly filled, under certain conditions, are a more prolific cause of neuralgic reflex conditions than dead teeth in which there are products of inflammation. Then, again, live teeth that have been properly treated may produce a temporary reflex condition which can be soon overcome.

A young lady was brought to my office only a week or ten days since, who had admirable work done on her teeth, and everything was reported by her dentist in excellent condition; but after the work was finished there was set up a severe otalgia neuralgia, and odontalgia. Her brother, who was a competent, well-instructed scientific man, took her again to the dentist, who pronounced the work all right. Not being satisfied as regards the condition of things, her brother brought her to me. I found no evidence of any general or local inflammation. I satisfied them both that they had no reason to condemn the work of the dentist as in any way objectionable, and in a short time that reflex action had all passed away.

Another case will illustrate the same thing in faulty work. A lady, thirty-two years of age, had some dental work done, which was immediately followed by facial neuralgia and otalgia. She was taken to the dentist by her father, who is a teacher in one of the public schools, and the dentist declared the work to be all right. She was then taken to an aurist, a young man who, perhaps, had not had much experience in that line, and he examined the case and explained the neuralgia as being caused by sub-acute otitis, and he treated the case intelligently by mechanical means. Then a council of the dentist, the aurist, and the family physician was held, and the conclusion was that the patient should go to the country for the summer. She went, and was gone three months. During that whole time she suffered from severe neuralgia. On her return to the city I saw her, and, in examining the case, I put a dental file between two crown fillings in the lower teeth; it seemed to me that the fillings

were too high; that the crown was filled to an unwarrantable extent, so that the whole force of the jaw was brought on these two fillings, and that was an explanation of the neuralgia. The removal of those fillings relieved the neuralgic trouble immediately, entirely, and permanently. I advised her to have all the other fillings removed and the work put in proper order. Since that time I have received a letter from her expressing great gratification at the result.

I will recite one other instance. A gentleman, fifty years old, had a catarrhal difficulty in both ears. There was a condition that the aurist would recognize the world over. On the right side the hearing distance was very much reduced. I treated that man to the best of my ability with the ordinary mechanical means, and by the administration of such remedies as the case seemed to indicate, and I improved the hearing. Then there came a point when there was a relapse and almost complete loss of the amount gained by the treatment. I made another examination, and expressed the opinion that there was a condition of the teeth that should explain the difficulty. The gentleman pooh-poohed at it, and, as he was sent to me by the late John F. Gray, M. D., a man much older than I, he went back to him, and was advised to follow my directions. He went to a dentist, who removed a filling in one of the teeth and found a condition which explained the whole matter. He treated that tooth, and the other teeth related to it, for quite a long time, thereby removing the cause of the disturbance, and the neuralgia was cured. The symptoms of this man's case were somewhat remarkable. He not only had facial neuralgia and neuralgia of the ear, but also of the muscles of the right side of the neck, and of the shoulder and arm as far as the elbow, and a portion of the sympathetic supply of the right side. And all this trouble disappeared as if by magic when the teeth were treated.—*Cosmos*.

Health, like success in life, is to be gained by attention to details. It is better to try to keep from catching cold than to be always trying to avoid infection. More can be done to check cholera by keeping houses clean than by using tons of disinfectants. Nature gives health. It is man's perversity in departing from the teachings of nature that leads to disease. Nature intended all to have fresh air, sufficient plain food, uncontaminated water, and exercise. Let us accept of nature's bequest, if we prefer health to disease.—*Herald of Health*.

“*A Mother to a Mother on Children's Teeth.*”—It is invaluable, and strikes the key-note of the reforms necessary for Americans to have sound and perfect teeth and better health. No work of equal size has ever been published containing so much that is of vital interest to mothers on this important subject.—*Health and Home*.

ANALGESIA FOR ANESTHESIA.

Dr. Bonwill says: For eight years my gasometer, holding one hundred gallons, has been idle. I gave nitrous oxide with great pleasure before I thought of rapid breathing, but since then I have used no anesthetic. Dr. Brown-Séquard informed me in 1881 that he read my article on rapid breathing, and knew there were certain physiological facts bearing on the subject, and that he illustrated it in his lectures before the students. In this act the breathing is five times as fast as usual. When running we must keep up rapid respiration to maintain the proper supply of oxygen in the blood. While the ordinary pulsation is not over eighty, and in rapid breathing is not over ninety, the respiration increases from twenty to one hundred. Now, while the lungs are making one hundred respirations, and the heart maintaining its ordinary pulsations, five times the amount of oxygen is put into the blood, which, mingling with the carbon of the blood, sets free carbonic acid gas. I believe from all I have seen, that it is this excess of oxygen in the blood which causes the temporary insensibility to pain.

It would be almost impossible for one taking one hundred respirations per minute to breathe over a minute or a minute and a quarter; the next minute he would hardly take two respirations, showing that there was an over-oxidation of the blood. The first clinic I ever gave before any public body was before the class of the University of Pennsylvania. It was a complete success. To that I had the attestation of the students, dental and medical. As far as extracting teeth is concerned, the secret of success lies in the fact that, as carbonic acid gas escapes so quickly, we must operate while the patient is breathing rapidly and before he is exhausted. If five, eight, or ten seconds are lost in getting something ready, or in hunting for an instrument, the result will not be as satisfactory.

In running, the action of the heart is quicker, in order to support the increased physical exertion. If there is not the same proportion of air going into the lungs while the heart is propelling the blood so rapidly and forcibly, what will be the result? It will produce asphyxia at once; but as long as the man takes that amount of air into the lungs which is needed by the increased action of the heart, the increased respiration makes it all right.

Analgesia is the opposite of asphyxia. Asphyxia comes from a want of oxygen in the blood; this comes from an over supply of oxygen. The secret is in the heart not pulsating in proportion with the respiration, so as to allow the heart's action to correspond with the action of the lungs. If dentists will experiment with this mode of anesthesia they will find it to their advantage.

CONTINUOUS GUM.

L. P. HASKELL, CHICAGO.

Why such different estimates on its value?

After more than thirty years' use of this work, I can truly say I have found it the strongest, most durable, and the *only* perfect method of construction of *full* artificial dentures. I have cases that have been worn thirty years; hundreds of them twenty-five and twenty years; I expect any case can be worn at least twenty years. Of course, this does not allow of dropping into wash-basins; ninety-five per cent of repairs on my own work are the result of this, though I always caution patients never to wash over a basin.

Notwithstanding this experience, I have often heard dentists say they do not find it durable. In fact it was abandoned very generally by those who commenced its use in its early days, as well as by many of later practice. I was one of a dozen who purchased office rights in Boston, when Dr. Allen first issued his patent; within a year every one but myself abandoned it. Why? The agent who introduced it was totally incompetent for the business, and his instructions were such I felt assured all who followed them would make a failure. He said it was not necessary to use *backings* for the teeth; that the attachment of the porcelain was all that was necessary. The work was put up in this way—no effort being made to strengthen it—in view of the fact that platina was a soft metal and liable to spring; they did not even cover the whole plate with the porcelain, as is now done, to increase the strength.

I made use of backing in my first cases; not satisfied with this, I connected them with strips of platina; afterwards adopted the *continuous* backing, with foot-piece soldered firmly to the plate.

My aim has always been to make the case as strong as *metal* could make it, holding that the strength of the work was *in the metal*—of course the porcelain adding to it. If the plate yields to the pressure in the least, the porcelain must crack. A few years ago I thought a thinner plate might answer, and so used gauge thirty instead of twenty-eight, and to my sorrow found cases were breaking down. The *perforating* of plates in order to reduce the weight is a mistake; the gain is nothing in weight, the loss is great in strength. Weight I do not consider a factor in this work; I have never had to replace it with other work on account of weight, though I have had patients complain of the weight of rubber, and yet when replaced with continuous gum there has been no complaint of weight. A case made for a lady in Minneapolis, recently, the dentist reported her as saying she thought "it did not seem as heavy as her rubber plate."

In the early days of the work the material was not perfected, as a few years later; it was not as strong and did not work satisfactorily;

but for twenty-five years it has proved all that one could wish, but the old stock gave out, and within a year or two the new material has not been as satisfactory in all respects.

But I repeat, "continuous gum" stands to-day unrivalled for artificial dentures, and a monument to Dr. John Allen, who, I am glad to know, still lives to enjoy the fruit of his labors, and to behold his own monument, more enduring than brass.

There is a class of cases where it is impossible to insert a decent looking set of teeth by any other process. I refer to patients with prominent upper maxillary and shallow lips, who show teeth and gums, often very high. Such require a porcelain gum, but no gum sections were ever made which could be used by persons of such features, because if the teeth were in proper position the gums of the teeth would be so thin as to have no strength. But with the continuous gum the teeth are set under the margin of the plate, and the gum applied as thin as necessary, and still strong because it is baked to the plate, so that the operator who has taste in selecting and arranging teeth, and also the gum, can make for such mouths sets of teeth defying detection.

EDITORIAL RESPONSIBILITIES.

EDITORIAL IN THE "INDEPENDENT PRACTITIONER."

The question of the extent to which editorial supervision of the communications of correspondents should be exercised is a vexed one. Occasionally, a generally well informed man falls into egregious errors in writing on a subject with some phases of which he is not familiar. Shall the editor take the liberty of correcting such mistakes, or shall he let his correspondent exhibit his ignorance? Many writers are extremely sensitive concerning any editorial liberties with their manuscript, and resent even verbal alterations, made by one who is supposed to be an expert in the use of written language. Yet such changes are sometimes essential to explicitness. Some editors shrink all responsibility by a standing notice that the journal is not responsible for the expression of opinions by correspondents. But if any writer is allowed, without protest, to present absolutely false teachings, few readers will hold the editor entirely blameless. On a debatable question the utmost liberty undoubtedly should be allowed, but on vital questions of fact, what is the editorial duty?

In the September number of one of our dental journals, for instance, a correspondent is allowed to say concerning nitrous oxide: "When breathed, it produces anesthesia by depriving the blood of oxygen, and causes sensations similar to those experienced in drowning."

This, in effect, is the declaration that the anesthesia of nitrous oxide is nothing but asphyxia, an assertion than which nothing could

be more false. Such teachings are dangerously erroneous, but does the proper "editing" of manuscript justify the correcting of such misconception? If so, then the editor becomes the arbitrary censor of all that comes under his hand, and his journal will be likely to reflect only his own opinions. If, on the other hand, his duties extend only to the correcting of grammatical, orthographical, or typographical errors, and to the general euphonistic presentation of papers, he is likely to publish an infinite deal of misconception and untruth. It is a vexed question, and the editor who escapes censure, by either writer or reader, is possessed of extraordinary tact, or is unusually fortunate.

There is another phase of the question: Shall an editor permit flagrant and known plagiarisms by his correspondents? The instances of willful cribbing from others, of the presentation as original of whole pages bodily stolen, are not infrequent. Sometimes these literary thefts are from sources probably unknown to the editor, and in such cases he is, of course, blameless.

An instance of this is found in a paper on anesthesia, read before the Minnesota Dental Society, and published in one of our journals. It had a strangely familiar sound, and on reference to a paper read by us before the American Dental Association, at its meeting in Boston, in 1880, and afterwards published in pamphlet form, we find an identity in thought and expression that is too complete to be the result of mere coincidence. Whole paragraphs are, word for word, the same in both articles. Let any one compare the paper as published in *The Dental Register*, with the one in the Transactions of the A. D. A. for 1880, and note the something more than similarity. As our article had the advantage of five years in its presentation, we feel that we cannot be charged with having borrowed it from Dr. Jenison. We rejoice that what we said made so deep an impression on one mind, but we wish for his own credit the author had made some explanation of the identity of both thought and expression.

Of course no editor can be held responsible for the presentation of a literary piracy unless he has knowledge of it, but what is he to do in cases of absolute misconception and misstatement of scientific facts?

"*A Mother to a Mother on Children's Teeth.*"—The readers of the *Independent Practitioner*, in almost every number for some time past, have had ample evidence of the talent which the author possesses for catching the striking points in a dental essay or discussion, and that faculty has enabled her to present in this book those vital facts which it is so essential for all mothers to know. This edition is a great improvement on some of those previously issued and does its enterprising publisher credit.—*Independent Practitioner.*

CAUSES OF CARIES.

PROF. CHARLES MAYR, SPRINGFIELD.

There are many ways of preventing fermentation, introduced by different inventors. Take the ferment of yeast; when we cool it down to about 35° F. it becomes inactive. From that point (when it begins to act) up to 130° F. it is active, but at 150° all its activity ceases. Therefore, in temperature we have one means of keeping down fermentation and putrefaction. When liquids are kept at a low temperature no fermentation sets in. Meat, butter, and milk are all preserved from fermentation or putrefaction in low temperatures. Another means is a high temperature. But, of course, these means cannot be used in the mouth. There we have to take away all the food for it. We only see where we fire a shot, but never know exactly where the bullet lands. We can apply any purifying substance in the mouth, but what do we really do? We are entirely in the dark. Let us get light in that direction, and investigate by every means the principles of these things. What do we know about the action of cocaine? Why a certain agent acts in a certain way, is a far more important question than that it does act. In preventing and removing fermentation I should avoid the continuous application of antiseptics. The old remedy, cleanliness, is sufficient for all cases,—it leaves just enough “bugs” to start an opposition. Under certain conditions human teeth are bound to go; their decay cannot be stopped. Human teeth have a kind of kismet that comes from the parents. In many cases school children are overworked, and their mental condition and nervous systems are disorganized; but their teeth are ruined because their parents did not give them any better. A man is not an individual by himself; he is entirely a product of parents. We have no proof whatever that suppressed pain may not turn out much worse than pain endured. We have the most remarkable reappearance in children of maladies which their parents had many years before. After a certain time a child gets neuralgia, and you hear the remark, “My mother had it exactly the same way.” What is the connection of that neuralgia with the one the mother had thirty years ago? They say, “My teeth are going, and my father’s went exactly that way. My molars are gone, and I remember hearing my father say he could not chew beef.” This congenital defect in the teeth, or tendency to decay, is a far more important factor, in my opinion, than the processes of fermentation and putrefaction in the mouth. As a rule, dentists need not be afraid of fermentation in the mouth; it does but little mischief beyond giving a bad breath. I think the congenital condition of the teeth is a far more important point for consideration than fermentation and putrefaction in the mouth.—*Cosmos*.

HOW TO USE COCAINE.

DR. E. H. RAYMOND.

The only way to get good results with the cocaine is to obtain a quantity of the soluble alkaloid and mix it at the time of using it. The requisites are a minim glass, a pair of small scales, some filtering paper, and a little water that has been boiled. It is necessary to have an easy working syringe, with a perfectly smooth, sharp needle. Care must be taken to exhaust the air from the syringe when charged ready for use. This can be done by drawing in more of the solution than is needed and pressing it out to the required number of minims. Hold the needle point *up*, so as to allow the air to get above the solution; then press the piston. (I might say, parenthetically, as a prerequisite to the above, that one should understand thoroughly the anatomical relations of the parts where the syringe is to be used.)

As during the course of the sensory nerves through the body they are accompanied by arteries and veins, it may be asked if there is not danger in puncturing these vessels with the point of the needle in injecting? Owing to the elasticity and toughness of the arterial coats and the small size of these vessels in the region where the practitioner would use the syringe,—they being very little, if any, larger than the syringe-needle,—there seems to be no danger of puncturing them. They would doubtless move one side should the point touch them. As to the veins, it would matter very little if the points should go through their coats. The preponderance of white fibrous tissue in their composition, though rendering them less elastic than the arteries, gives them great resisting power and sufficient resilience to render harmless so small an invader as the needle-point. If they were penetrated, the effusion of blood would be slight and harmless. From injecting a large number of cases no ill effects have developed in the needle-tracks.

That this method of using the agent will become generally adopted by the dental profession cannot now be foretold or foreseen. There seems to be no reason why it should not be in cases of excessive sensibility of the teeth. Compared to all known methods for producing temporary and local anesthesia, this agent surely promises to take first rank. Its potency, its simplicity, and the marvelous localization in its range of action on the nerve-trunks and tissues, coupled with its apparent safety, should make it the boon of boons to those requiring an anesthetic for the amelioration of physical pain.

That we should understand just *why* it produces certain effects is not indispensably requisite. What do we *know* of the mysteries of animal and vegetable life? What do we *know* of the mysterious, subtle electric agent, or so-called nerve force? What do we *know* of the action of certain remedial agents on certain organs in the body?

. That we have an agent in cocaine that we can utilize in this eminently useful and practical way is a matter of sincere congratulation to us as dentists, as we can mitigate the severity of operations from which every sensitive patient shrinks.—*Cosmos*.

REPLANTATION.

G. H. GOODWIN, DENTIST, DERBY.

A medical man, Dr. W., a friend of mine, called in to see me regarding a troublesome lower bicuspid stump. It was the second bicuspid on the right side. It was so wedged in between the first bicuspid and first molar, that it was impossible to extract it without previously removing one of the other teeth.

I extracted the first bicuspid, and then the stump of the second. After stopping the bleeding a little, I replaced the bicuspid tooth, which is now thoroughly set, and from the first has given no pain.—*British Den. Science*.

[We had a similar success six years ago. Two years after the replanting, the patient came to have the replanted tooth filled. It was then doing good service. We have several successes in the replantation of bicuspids and incisors, but not with molars.—Ed. ITEMS.]

“*A Mother to Mothers on Children's Teeth*,” is the title of a book written by Mrs. M. W. J., the wife of a prominent New Orleans dentist. After reading it we wish that every mother in the land owned a copy. It is filled with the most curious and valuable information regarding the growth, care, and formation of children's teeth, and contains many details and much instruction on this important subject that is scarcely known outside the science of dentistry. It is written with a thorough comprehension of the subject gained by the careful study and scientific acquirement of Mrs. Walker, who becomes greatly interested, through her husband's profession, in the paramount importance of saving and perfecting the teeth. She became fully awake to the gross carelessness, ignorance and neglect of mothers in this direction, and resolved to write this little book to enlighten them on the question, and to guide their efforts in preventing the decay of their children's teeth which leads to other diseases. These letters to mothers were first published in the *Southern Dental Journal*, but were considered so valuable an acquisition to dental literature, that they are now published in pamphlet form, with interesting illustrations. Dentists will find it especially useful and time saving, to hand this little book to their patients in answer to many questions regarding the preservation and formation of the teeth.—*Hartford Times*.

THE USE OF ENGLISH TUBE TEETH.

LAWRENCE VANDERPANT, L.D.S., ORANGE, N. J.

The English firm of dental manufacturers, Ash & Sons, have brought to this country a large stock of artificial teeth, some of which would sorely puzzle the average American dentist to utilize. They are called "Tube Teeth," and are almost a counterpart of a natural tooth, excepting that the nerve canal is of larger diameter, passing entirely through the tooth, and it is furnished with a solid, substantial lining of platina.

Till some twenty-five years since, this description was *the* artificial tooth used by the European dentist (certainly the English), the majority not even knowing the method of working "American Flat-back Teeth" as they were called.

Now these old-fashioned English teeth, which will doubtless be pronounced by some of our shining lights remnants of old fogysm, are not without their use in modern practice, as I propose to show, and are a very useful adjunct in the office of the practitioner of prosthesis. In a case, for example, where we desire to replace the lost bicuspid and molars by means of a gold or platina plate, they will afford a stronger, broader, and more solid masticating surface; they can be much more accurately fitted to the plate and hermetically united to it by means of the sulphur cement employed in fastening them to the metal pins, so that they are more cleanly in wear than plate teeth of ordinary construction. As only a very small quantity of solder and heat is requisite in mounting, there is no danger of warping the plate, and last, but not least, in case of fracture, teeth are readily and quickly replaced without the necessity of passing the plate through the fire, which will be an acknowledged advantage. But of more general and special value would they be likely to prove in crown or pivot work, using them somewhat after the plan of Bonwill or Howe, that is to say, securing, by means of amalgam, cement, or gutta-percha, a pin, pivot, or post into the natural root, and adjusting thereon the artificial tooth crown.

The plan I adopt myself is to first prepare the root and canal, and I find it a saving of much time and trouble to take a small wax model and articulation of the region in process of repair, making a plaster cast therefrom, and to accurately fit and articulate the Tube Tooth to it. It is now absolutely requisite to have "easy tube-sized hard platina or dental alloy wire,"* and proceed to complete the work at the chair. Determine the length of wire requisite for the root and carefully "tin" this portion only.

It may be unnecessary to state here that this is very easily ac-

*The manufacturers supply this wire to exact gauge requisite.

complished by dipping the pin into a solution of chloride of zinc, heating it over an alcohol lamp, and rubbing it on a piece of common domestic tin previously heated.

Two or three small scraps of zinc immersed in dilute muriatic acid (a dram or so) will conveniently form the chloride.

Roughly and deeply "barb" the root portion of the pin, cut off accurately sufficient to carry the Tube Tooth, and file up to the bifurcation of its lingual surface.

The pin is now securely fixed into the root with amalgam, taking care that its position shall exactly correspond with the tube in the crown.

I should have anticipated the fastening of the Tube Tooth to the pin by advising it to be just sufficiently roughened to catch a strand or two of finest floss silk, previous to fixing it in the root.

It will be within the discretion of the operator to await the thorough hardening of the amalgam previous to securing the crown, or to proceed at once; in either case, it is merely necessary to wind a small quantity of floss silk around the pin and apply a strong mastic solution to the tube, and press the tooth into position by a suitable pair of forceps protected with a chamois skin; possibly a judicious tap or two of the protected mallet may make a more perfect joint. The following day an artistic finish may be given to the pin head and lingual surface of the tooth by means of a round headed corundrum bur in the engine. I claim for this method many advantages over different methods now in vogue; prominently may be mentioned, great strength, not only from the platina tube, but from the superior hardness and density of the tooth body, and that the crown is fixed without danger of displacement the moment the patient leaves the chair. The objection might be raised that you do not secure a water-tight joint, but I doubt not natural ingenuity will readily surmount this objection.

The weak points in the "How" speak for themselves; it is unnecessary to allude to them.

The complicated and expensive work in connection with the gold crown method becomes superfluous in presence of the Tube Tooth plan, and lastly, accident can be so readily provided for that the patient, by furnishing him with duplicate teeth, can rectify it himself.

In writing, I have not had in my mind the replacement of the molar teeth, but a little ingenuity will suggest a means of making Tube Teeth serviceable in such cases.—*Independent Practitioner*.

[The tube molars are also to be had.—ED. ITEMS.]

Crucibles of nickle have been adopted in some chemical laboratories in place of the silver ones generally used for melting caustic alkalies. That they are cheaper and resist a higher temperature.

ADAPTABILITY VS. COMPATIBILITY.

DR. W. G. A. BONWILL, PHILADELPHIA.

Adaptability, and not *compatibility*, is the *positive law* which bids us on to a higher state of perfection. While I differ widely with my friend who cries *incompatibility* in his theory, I am with him heartily in his effort at saving wrecks of teeth that but few will attempt. Stranded teeth given to the wreckers he delights to take, and does save by *not using gold*, though not in the most esthetic manner. Whoever will forsake the indiscriminate use of gold and determine to *save teeth* on the principle of adaptability of material according to the skill of the operator, will do the same wise thing as is being done by the opposers of gold *in toto*, and be enabled to give a much more artistic show for the materials used. While I cannot adopt the incompatible theory, I do say God-speed to any man who is able to save teeth satisfactorily to his patients, let his creed be ever so incompatible with known physical law.

Salvation of the teeth is the *creed* and *watch-word*, and we are, many of us no doubt, doing the same thing from apparently antipodal standpoints. Let us raise a flag-staff and rally round a banner by common consent, with such an emblem as heads my paper, with charity for every new idea spread before us. In adopting a code of action it is well it should be one which appeals to common sense and to the known laws of the universe of forces.

The nearer we can make men understand cause and effect the better reason will come into action on all occasions, and better results will follow. Proclaim whatever theory we may, there are hundreds in practice who will not grant it, because the majority are not educated in common physics, let alone the chemistry of the elements composing all nature. It will be in vain to appeal to such. Nothing short of demonstration in every little detail, and showing them the results of practice, through many years, will reach them.

Men will not believe what others say. The most minute description in print will be read and passed. If a committee of one or more could be appointed by every State Society to visit the most advanced operators and stand by their sides at the chair and see all classes and grades of work done for the various conflicting cases that daily present themselves, an immense stride would be made, and we would better appreciate each others' efforts. The invitation to such men, with some inducements to leave home to appear before societies, would probably reach further. The former plan, however, would be more compatible with the feelings of such radicals, as they would rather be found at home, where everything works more harmoniously.—[Odontological Society of Pennsylvania].

SAVING ROOTS.

Dr. J. Taft says: I can remember, and it is not very far back, that if there was a pulpless or inflamed root in a mouth, the best method was thought to be to take it away, for fear it might do mischief at some future time; and often teeth were removed with the pulps alive. I have known many cases where good teeth were removed to make way for artificial dentures. Such would not be the treatment now. All teeth and roots that can be made useful, in any way, should be retained. They preserve the form of the features and do good service. In a quarter of a century the practice has so changed that the removal of what was formerly regarded as a nuisance would now be severely censured. The subject is receiving as much attention as any now before the profession. The practice of some is commendable in this respect. They act like the skilful surgeon who endeavors to save any part that may be restored to usefulness. I believe the time will come when roots, such as some of the most skilful now destroy, will be saved. If roots are allowed to remain they must, of course, be restored to health.

There are many methods of crowning these roots, though no one is good for all cases. Only by wide study and conscientious efforts will you succeed. If you fail, do not give up, try again. We cannot expect to succeed at once with a new method, though it may have great merit. Sometimes a root will be rebellious, and we fail, but that should not discourage us. Physicians lose cases, so shall we be unsuccessful; we should go on in the expectation of success, and be exceedingly careful how we sacrifice teeth or roots that might be saved. If a pulp dies it must be without any assistance from me. A physician might as well decide to kill his patient because he thought he might not get well. Never use so deleterious an agent as arsenious acid.

Cocaine in Filling Teeth.—A dental surgeon recommends the following in the *British and Colonial Druggist*:—

R Cocaine pur.....	gr. vi
Iodoform.....	gr. x
Gum mastic (q. s.).....	gr. iij
Ol. eucalyp vel eucalyptine.....	gr. viij
Chloroform.....	ʒ ij

Dissolve the cocaine and iodoform in half the prescribed quantity of chloroform, and the other ingredients in the remainder, then mix the two solutions. If required for "painting" round a tooth, on the gums, or elsewhere, but not for "stopping" purposes, the mastic should be omitted, while, on the other hand, the quantity may be increased if a tenacious semi-fluid substance (rendered mobile by warming) for direct application to hollow stumps be needed. This preparation should be kept in tightly corked tubes in bottles.—*Science News*.

FOR DEEP MOUTHS AND WHERE THE RUGÆ IS DEEP AND PROMINENT.

Place a piece of muslin, such as is found between the sheets of rubber, on the part of the flask containing the rubber, then close the flask in hot water till pressed together, and separate. Remove the cloth, when the rubber will be found to be evenly pressed. Then place the cohesion form, correspondingly cut, on the part of the flask containing the rubber, and screw down, and vulcanize.

The muslin should be saturated in water before placing it on the rubber.

By this procedure the impressions will remain intact on the surface form, and not effaced. And the projections will come out well defined on the plate.

This will be of great advantage, as, after the flask is separated, it will be seen if there is a sufficient quantity of rubber, if not more can be added.

JOSEPH SPYER, D. D. S.

“*A decaying tooth* has no destructive influence on the other teeth unless in actual contact, but tends to localize the trouble in the mouth, thus exempting for a time other teeth, which are next liable to decay, from any decided disintegrating influence.”—PROF. J. FOSTER FLAGG.

How does that look for truth and science?

Mercury in Amalgam Fillings.—Dr. Bogue says: “Amalgam fillings are found in the mouth uncorroded by iron or acid drinks. Sulphur collects on amalgams, and blackens them, but it is from the effect of the acid. If amalgams are inserted with a good deal of mercury and a powerful pressure, it brings the mercury to the surface, and thence it may be carried to the stomach. I have read, within the past two months, of something like two pounds of mercury being put into the stomach by a tube, and in a few days being discharged and the patient recovered. I think we may safely assert that metallic mercury is harmless, unless it is converted into an oxide or chloride.”

The Health and Home, published in Toledo, Ohio, is making a rather new departure. Believing good teeth are essential to good digestion, good temper, and good health, it makes the subject of dentistry almost as prominent as a dental journal does. It would be a good paper for to keep on the reading table of your office. Arrangements can be made with the publisher for extra copies for distribution among patients, cheap, with something of your own production, if desired.

The dentist's bills at Vassar College are said to be something frightful. This comes from compelling every girl to eat a piece of her first cake.

FERMENTATION AND PUTREFACTION.

PROF. CHARLES MAYR, SPRINGFIELD.

Fermentation is the decomposition of non-nitrogenous substances under the influence of micro-organisms, and putrefaction is the breaking up of nitrogenous substances under the influence of micro-organisms. To make the definition agree with the popular idea of both processes, we have to say that the products of putrefaction must be offensive to our senses to deserve that name.

By carefully examining all the different ways of breaking up of organic substances, we find very many varieties. One of them is putrefaction. Each of these varieties uses up a small amount of nitrogenous substances; and one of them, which might be termed a variety of putrefaction, breaks up the nitrogenous substance, urea. I will give a few varieties of fermentation and their products. The most important is that of sugar into alcohol and carbonic acid. We know exactly the fermentative plant which produces it. It is the yeast. One ounce of dry yeast will transform one-twentieth of an ounce of grape sugar into alcohol and carbonic acid in about twenty minutes. The yeast seems to be the type of drunkenness. If there are no more substances at hand to make alcohol from, the yeast makes the alcohol out of its own body! During the fermentation of alcohol a certain amount of sugar is transformed into glycerine and succinic acid. The budding of the yeast in an alcoholic fluid is not its propagation; the propagation takes place when the yeast is starving, a phenomenon which has analogies in human life.

Who of our citizens are most blessed with children,—those who enjoy all the luxuries of life, or those who can hardly keep souls and bodies together? The overwhelming percentage of children occurs in poor families, and sooner or later, by a natural process of lack of progeny, rich families are broken up and die out. Some lucky poor relative gets the wealth. He makes the wealth ferment, but loses power while enjoying the fermentation. For a couple of generations the old strength still holds good, till slowly but surely his family dies out to make room for others.

At certain conditions of temperature milk ferments and gives alcohol, but ordinarily milk undergoes another fermentation,—that called *lactic fermentation*, produced by a micro-organism of entirely different habits and structure from that of the yeast. The product is lactic acid. This sour milk is easily digested, and while lactic acid pure and simple has not been found a very useful thing to eat, a certain amount of lactic acid in sour milk is easier digested than the corresponding amount of sugar of milk, which our stomachs always transform into lactic acid. If we allow sugar, chalk, and old cheese,

to stand for a certain time in summer temperature, a microscopic plant forms which produces *succinic* and *butyric* acids; in a similar manner other acids have been obtained.

In the variety termed ammoniacal fermentation, or "putrefaction of the urine," the urea is split up by a peculiar micro-organism into carbonate of ammonia and products which the little organism needs. Toward the latter stages of all fermentative processes a new organism appears, very small but very powerful, the bacterium termo, which destroys the last destructible remnant of organic nature. Peculiar odors are generated during its existence, and *putrefaction* has begun. So long as the other processes take place with overwhelming masses of micro-organisms, we do not perceive very decidedly the products of putrefaction; but they exist. These odors of putrefaction, so powerful and disagreeable, are not rare in the mouth.

According to the experiments of Dr. Miller, lactic acid is the one which disorganizes, decalcifies, and softens the plug of dead dentine in a carious cavity.

The following substances have been proved to be transformed by ferments: Glucose into alcohol and carbonic acid; lactose into lactic acid (two molecules); levulose (cane sugar) into lactic and carbonic acids; malic acid into succinic and carbonic acids; lactic acid into butyric and carbonic acids and hydrogen; cane sugar into arabinose, mannite, and carbonic acid; urea into carbonic acid and ammonia; glycerine into propionic acid; tartaric acid into isopropionic acid; tartaric acid into butyric acid; malic acid into valerianic acid; succinic acid into valerianic acid; alcohol into acetic acid; albuminoids into leucine, tyrosine, amido compounds; mucic acid into acetic acid; citric acid into acetic acid; alcohol into glycerine; cane sugar into glucose.

Quite different from these organized ferments, which, so to speak, manufacture their own chemicals and machinery for the decomposition of fermentable matter, are the unorganized ferments like ptyaline, pepsine, pancreatine, emulsine and diastase. Even platina belongs in this group. Poisons have no effect on the latter ferments. *Simple acetate of potassa* is one of the best germicides known,—is far more powerful than arsenic, which has hardly any effect on micro-organisms and ferments. Has our consumption of vinegar something to do with that?

Many say that fermentation is a process of plant life, and that putrefaction is a process of animal life. That distinction cannot be held good in all cases, for there is sometimes putrefaction in plants as well as in animal matter. If you moisten wheat flour and press out the cellulose and starch, you get a sticky mass of gluten; and if you let that stand in moisture in a moderately warm temperature, it

becomes as putrid as meat can ever be. The difference is merely apparent, raised for speculative purposes. It is also said the products of fermentation are, as a rule, acid, while the products of putrefaction are alkaline; but in uric fermentation there is an evaporation of ammonia from the urine.—*New England Society.*

BROMO CHLORALUM.

"A Subscriber" asks for a prescription for healing and hardening the gums after extraction; also, for a *nice* astringent mouth wash.

I have used, for years, "bromo chloralum." Ask your druggist for it.

For office use: One part "Bromo" to eight parts water, or stronger if desired. It is harmless.

Should your patient's breath nauseate you, require the mouth to be rinsed with "bromo," repeating, if necessary. It is good also for catarrh; dilute and snuff it up the nostrils.

Are you annoyed by perspiring armpits, or feet? Use the "bromo" in bathing them.

Try it for those annoying ulcerations of the oral cavity arising from disordered stomachs; for sore throat, acute or chronic.

Is there an odor about the office or sick room, from whatever cause? Dampen a sponge with the "bromo" and lay it on a dish.

Try it as a mouth wash where there is sponginess or pus-flowing condition of the gums; after removal of tartar; in Rigg's disease; in inflamed mucous membrane under plates.

Its action in burns or scalds is *magical*.

A patient using "bromo" properly after extraction will not suffer from cold or inflammation. Give it a trial and be convinced.

BROOKVILLE, Indiana.

J. E. MORTON.

Cocaine.—Perhaps its most pleasing results have been obtained in the removing of living pulps, and in the painlessly cleaning root canals. In one memorable instance, that of a lady, a former patient, who is now living in a distant city, and who had but one day's time for operations, a living, intensely sensitive, inflamed, exposed pulp was found. By the aid of a minute quantity of the muriate crystals, with which a nearly saturated solution was made for immediate application, the pulp was removed absolutely without pain, and the root and tooth were filled at the same sitting, nor has there since been any soreness or irritation.—DR. W. C. BARRETT.

The Nebraska State Dental Society is in a flourishing condition. Who would think it possible for such a society in such a new State to be nine years old? How the West does grow!

THE BEHAVIOR OF MATTER.

PROF. J. R. NICHOLS, BOSTON.

The study of the behavior of matter has not resulted in throwing satisfactory light on the problem as to what it is. To the modern experimenter, matter is only known by what it does. It is said to have weight, but if gravitation is, as seems probable, only a "wave motion" correlated with light, heat, electricity, etc., we are deprived of the most significant method of designating matter in its apparent or gross conditions. Matter has form and substance; but if, as has been proved, the interstices between the molecules, so called, are so great as to allow of ceaseless motion,—an unending clashing of forces,—our ideas of solidity or substance vanish. If matter is not what it seems to be, in so far as weight and substance are involved, there is little left in the universe but what is regarded as force and "ether," and of the nature of these we know nothing positively. The ether of space, concerning the existence of which there is scarcely room for doubt, is matter, but in such an attenuated form as to approach the supposed condition of spirit. Professor Tyndall thinks this ether to be matter, but not a form of ordinary matter. As we do not understand the form of ordinary matter, it is hardly philosophical to assume that an unknown form is like or unlike another no better understood. In discussing the constitution of matter, the existence of atoms and molecules is assumed; but have we any proof of the existence of these bodies, or have we any language in which we can satisfactorily describe them? We can easily conceive of things we cannot see; but when we come to atoms, the mind can no more comprehend their minuteness, if they exist at all, than it can the infinity of space in the stellar universe.

Faraday, in speaking of atoms, calls them "lines of force," "centers of force," and does not seem to regard them as little bodies surrounded by forces. He remarks in an interesting paper that "the force of forces constitutes matter; there is no space between the particles distinct from the particles of matter." This is a confused statement, and serves to show how a great mind will struggle in attempts to comprehend the incomprehensible. Another distinguished physicist calls atoms "mathematical points," a term which has no meaning in the connection in which it is used.

The existence of atoms and molecules as distinct bodies being assumed, attempts to define their minuteness might be expected from those who never shrink from the solution of the most intricate problems. The highest powers of our best modern microscope will enable us to see objects $\frac{1}{80,000}$ of an inch in diameter, and we may inquire what sort of relation this power of microscopically assisted vision bears to the probable size of molecules of matter. The results obtained by

Stoney, Thompson, and Clerk-Maxwell, in attempts to calculate from different data the number of ultimate atoms in a given volume of any permanent and perfect gas at zero, and at a pressure of one atmosphere, vary greatly. Thompson assigns as the greatest possible limit 98,320,000,000,000, in $\frac{1}{1000}$ of an inch cube, which is $\frac{1}{1,000,000,000}$ of one cubic inch. Clerk-Maxwell made it only 311,000,000,000, Stoney 1,901,000,000,000. Mr. Sorby has stated that he feels justified, for various reasons, in doubling Clerk-Maxwell's figures, and assumes the number of atoms in a cubic $\frac{1}{1000}$ of an inch of gas to be 6,000,000,000,000. These numbers are sufficiently astounding, but the enormous difference in results serves to show how little is absolutely known, or can be known regarding atoms. If there exist such bodies as atoms, they are, as Mr. Sorby suggests, so infinitely minute, that *light is too coarse a medium* to enable us to see them, even if we could add sufficiently to the powers of our microscopes.

It is clear, if we do not know what matter is, that the nature of material man is still an unsolved problem. As he stands revealed to the sense of sight, we have impressions of form, of substance, of that which is real, and these impressions answer all the purposes of our material condition of existence. Life may be a delusion, a dream, and there is much to lead to such a view; but it is nevertheless active, real, and crowded with momentous duties and responsibilities.

To Use Oxyphosphate.—I have read with interest the suggestions which have appeared from time to time, in the ITEMS, regarding the manipulation of oxyphosphate.

I am indebted to Dr. A. E. Brown, of Chicago, for a method employed by him in flowing it over badly exposed pulps, so as to avoid pressure, which I do not remember to have seen in print, and give for the benefit of the profession.

Take platina, about thirty-six gauge, and cut out a disc, shaping it so that it will readily pass in and out of the cavity.

With foil carrier catch hold of the edge of the disc and scoop up a quantity of the phosphate which has been mixed to a creamy consistency and carry to point of exposure.

Warm air current will expedite setting, after which the operation can be completed. By using the platina disc the phosphate of zinc can be mixed very thin, and with practice carried into the cavity with ease and certainty. After it sets the disc is readily detached and can be used again.—DR. C. J. BLACK.

Parian is a white cement said to consist of a mixture of plaster of Paris and borax. Four bushels of parian with an equal quantity of clean sand will cover ten yards superficial half an inch thick.

LEARNING TO USE ARTIFICIAL TEETH.

Editor ITEMS:—Dr. Haskell, of Chicago, answers your New Brunswick man's question for—information on the many causes which produce trouble in making plates fit, or stay in well. He describes the mouths well, but I think he should have gone on and described the *people* the mouths belong to, for instances: I would rather insert three sets for *three* women than one for *one* man. We ought to get three times the price for inserting a set for a man, that we do for a woman; then only under great pressure will I put in a set for a woman past seventy-five, and nothing would induce me to try it for a man. Again, take one who has been for years with only a few teeth; extract them, and insert a complete set, and if your patient is a man he becomes at once a nuisance to his neighbors, and to the horror of his poor, haunted dentist. I need not describe him further; the dentists who have been there will recognize the man at once. With such people I start with—yes I'll put you in a set but you are going to have a terribly hard time before you get used to them.

I think most dentists make a mistake in leading their patients to believe that their plate is going to hold in so tightly *by suction* that they will be able to eat with it. I am confident no one ever ate a morsel, depending on the suction of a plate to hold it in place during the operation.

A patient asks me, "Shall I be able to eat with this set?"

"Yes—after you have learned how! You must remember that you have been without molars for a long time and the muscles of your cheeks and your tongue have forgotten the art of feeding the food to the teeth. Till they have re-learned the lesson of their youth, you cannot eat; furthermore, it is the muscles of the cheeks and lips that must learn to grip the teeth so firmly as to hold them in place while you are eating. This is very difficult at first, but finally becomes an involuntary act, and then your trouble ceases." No doubt, the worst thing for the dentist is for the patients to get it into their heads that the set is going to hold in so strongly by suction they will be able to eat by that agency alone. The sooner the dentist succeeds in knocking that notion out of the patient's head the better for both.

For making Sheet Wax.—I would suggest a piece of common window glass, cut the shape and size desired, as a substitute for the "paddle" of wood. I think the glass makes a much smoother surface and the wax can be removed from it much easier than from the paddle. The sheets can be made thin or thick just in proportion to the number of times it is dipped.—W. H. DE FORD.

ANSWERS TO INQUIRY IN NOVEMBER ITEMS.

Cure for Odontalgia.—Apply to the cavity a small pellet of absorbent cotton, saturated in the tincture of cantharides, previously warming the bottle to temperature of about 100° to avoid a shock to the pulp from thermal change.

I have found it necessary at times to make several applications allowing the pellet to remain in the cavity at least two minutes.

Inflammation of Gums.—After many years use of the *phenol sodique*, I have found it the only reliable remedy, in allaying inflammation of gums, and arresting hemorrhage, after extraction of teeth. As a hemostatic, antiseptic, and disinfectant mouth wash, it has certainly no superior.

Phenol Sodique for Riggs' Disease.—In incipient and also in some bad cases, of Riggs' disease, I have had gratifying results. If persevered in by the patient, it will harden, and bring to a healthy condition, the worst case of spongy and turgid gums.

To Arrest Hemorrhage.—To arrest hemorrhage, steep absorbent cotton in pure phenol and apply to gums as a compress. For single extractions, plug alveolus with cotton steeped in phenol and leave it twenty-four hours.

As a mouth wash to harden gums, one part phenol and two parts water is very satisfactory; used three times daily.

NEW YORK CITY.

DR. J. LEWENBERG.

Chloroform and Water as a Hemostatic, or Arrester of Bleeding.—Many speak highly of this mixture in the following proportions: Chloroform 2 parts, water 100 parts. It is claimed that it acts with a rapidity that is truly marvelous: it has not the slightest disagreeable taste; it has no escharotic action; it is always at hand and made instantly; its cost is very slight; and there is nothing disagreeable in its application to interfere with the surgeon. In all operations on the mouth and throat, it is recommended to use this alone as a hemostatic. Recently in moving a sequestrum from the inferior maxilla, which was of the size of a large chestnut, by its use no blood was lost in what is usually a very bloody operation. A simple washing arrested all tendency to hemorrhage. In tonsillotomy, simply gargling the part or using the atomized spray is sufficient to prevent the loss of blood.

Editor ITEMS:—I would like a method of putting a fine polish on rubber plates. Are special instruments needed?

What is recommended for a matrice for gold filling on proximal surfaces of bicuspid and molars? Whose make, etc.

F.

EDITING.

[It is not wonderful that all who write for magazines are not exact and terse composers. When we do our best to make an article presentable, it does us good to receive such a frank note as the following.—ED. ITEMS.]

DEAR DOCTOR :—Enclosed please find a revised edition of my article. I thank you for your suggestions, which I cheerfully adopt. I will venture to say you have many admirers of your efforts at reform in various directions. Phonetics must be a law some day. Briefness and simplicity of expression in writing and speaking should add beauty to language if used with discretion. Of course, you know there are two extremes to every idea. A sentence may, by being beheaded and curtailed, express the same idea, but lose all its real beauty. Animals use very few words and have very few of the finer instincts. A heterogeneous mass of colors, like a corresponding mass of words, has little beauty, but properly arranged by an artist they tell a story which savors of the heavenly. Don't you think one of the weaknesses of man is to ride a hobby too far? I don't think you have, but *please don't*, and I, your humble admirer, will be but one of a great many who will continue to admire.

If you want to be miserable, be selfish.—Think all the time of yourself and your own things. Don't care about anybody else. Have no feelings for any one but yourself. Never think of enjoying the satisfaction of seeing others happy; but the rather, if you see a smiling face, be jealous lest another should enjoy what you have not. Envy every one who is better off in any respect than yourself; think unkindly toward them, and speak lightly of them. Be constantly afraid lest some one should encroach on your rights; be watchful against it, and if any one comes near your things, snap at them like a mad dog. Contend earnestly for every thing that is your own, though it may not be worth a pin; for your "rights" are just as much concerned as if it were a pound of gold. Never yield a point. Be very sensitive, and take every thing that is said to you in playfulness in the most serious manner. Be jealous of your friends, lest they should not think enough of you; and if at any time they should seem to neglect you, put the worst construction on their conduct you can. Thus will you keep yourself unhappy.

Children's Teeth.—A lady of Boston has submitted to the Mayor the plan of a novel charity, toward starting which she proposes to contribute \$50,000. "It is to create a fund, the income of which shall be used annually for the care of the teeth of children in the primary schools whose parents are unable to pay dentists' bills." At the suggestion of the Mayor "she will first try the experiment in one school."

WAX SHEETS.

Your journal for October contained Dr. Paffenberger's method of making sheet wax. I think I have a better way, viz :

Take stew pan and fill one-third full of water, and in this bath place an ordinary soup bowl one-half full of water, and in this put scraps of old wax, try plates and wax bites, (this is good way to utilize old wax), and set over flame till wax is melted, after which let wax harden, and take out of bowl.

All of dirt and sediment found on bottom of wax must be cut off and wax placed in bowl again and melted.

Make a cold bath, in wash-bowl, of soap and water. Take a piece of window glass, say three by six inches, dip in soap bath, then in melted wax twice, thence back to soap bath.

Glass is much better than a wooden paddle, and by dipping in soapy water the wax slips off without the use of a knife.

With the outside bath of water there is no danger of fire from wax boiling over.

OWENTON, Ky.

W. E. BAXTER.

A Western Minister, who paid a visit of condolence to the widow of one of his deacons, was shown the funeral wreath, which the forlorn "relict" described in broken accents, as follows: "The red flowers were made of his red flannels; the white ones of his white flannels. The stamens were made of his coffin shavings, and the pistils of his beard. The berries and buds were made of the pills that were left when he died, and the feathery part were made of the feathers of the last chicken dear James killed before he was taken ill."

Charcoal for root filling.—Dr. Helyar, of Bristol, England, advocates powdered charcoal for filling roots of teeth. He says his experience is that it is a good antiseptic and absorbent, is indestructable, easily introduced and easily removed if necessary.

"*A decaying tooth* has no destructive influence on the other teeth unless in actual contact, but tends to localize the trouble in the mouth, thus exempting for a time other teeth, which are next liable to decay, from any decided disintegrating influence."—Prof. J. FOSTER FLAGG.

[How does that look for truth and science?—ED.]

A writer in *Hygiene Pratique* states that boots and shoes may be rendered waterproof by soaking them for some hours in thick soap water. The compound forms a fatty acid within the leather and makes it impervious to water.

COCAINE.

WALTER W. ALLPORT, M.D., D.D.S., CHICAGO.

The introduction of cocaine as a local anesthetic, and the more general use of peroxide of hydrogen ($H^2 O^2$) in the treatment of dental and oral diseases, are the principal advances made in the medical department of our practice during the year.

The two forms of cocaine which have been most generally used in surgery are the hydrochlorate and the oleate. In operations in the mouth involving the mucous membranes, together with the immediately adjacent tissues, these preparations have proven so efficient there is little question of its value as a local anesthetic in such cases. But its action on deeper structures, such as involve the roots of teeth, is so uncertain as to render its practical benefits questionable in the operation of extraction. In the surgical treatment of pockets caused by pyorrhea alveolaris, the anesthetic effect of this agent is often so great as to render this sometimes very painful operation comparatively painless, and its employment in such cases should rarely be dispensed with. In the treatment of hyper-sensitive dentine as well as in the removal of tooth-pulps, its action as an anesthetic has, under some circumstances, seemed to be all that could be desired. But in far the greater number of cases it has proved of little practical value. More recently, however, a new form of cocaine, known as the citrate, has been introduced in Germany by Merck, and is now being manufactured by McKesson and Robbins, of New York. In a series of experiments, conducted by Dr. John S. Marshall, of Chicago, it has been shown that for operations on sub-mucous tissues, or in the extraction of teeth, it seems to possess no special advantages over the preparations previously named. But when applied to dentine or the pulp, its action—though not always positive—seems to be more reliable, especially on the dentine, and gives promise of better results. Under favorable conditions it produces anesthesia of the parts in from five to ten minutes, and the duration of the effect is of sufficient length to afford time for the preparation of the cavity. This effect has, in some cases, been prolonged for more than an hour. The pulp has been extirpated without pain after the drug has been applied in from three to twelve minutes.

If the citrate of cocaine be kept in solution for more than three or four days, it decomposes and loses its active properties. As introduced by Mr. Merck for dental purposes, it is made into pills by incorporating it with gum tragacanth dissolved in glycerine, each pill containing $\frac{3}{8}$ grain of the citrate. In this form it keeps well. A pill is applied to the sensitive cavity and covered with a cotton pledget, moistened in tepid water. It should be allowed to remain from five to twelve minutes, when—if at all—the desired result is produced. In twenty

per cent of the cases where the remedy has been employed, it has proven successful, but it is hoped that this percentage will be increased by a better knowledge of the drug and the improved methods of its preparation and use.

With this end in view, and at the suggestion of Dr. Marshall, McKesson and Robbins are now manufacturing granules containing one-sixteenth of a grain of the citrate of cocaine, without glycerine or other saccharine excipient, so that the obtundent may act more promptly than it can in the presence of sugar.—[Address at American Medical Association.]

Dr. Kulp's Method of Classifying Surfaces of teeth.

Central Insisors, right and left, upper and lower.						
Lateral	"	"	"	"	"	"
Cuspids	"	"	"	"	"	"
Bicuspid 1st & 2d	"	"	"	"	"	"
1st Molars	"	"	"	"	"	"
2d	"	"	"	"	"	"
3d	"	"	"	"	"	"

SURFACES—The six anterior teeth, superior and inferior, are labial, lingual, proximal, and occluding. Bicuspid and molars, buccal, lingual, proximal and occluding.

Division of surfaces longitudinally: Occluding or grinding, middle third, and cervical third.

Sub-divisions: Right and left central incisors—labial, lingual, occluding, central proximal, lateral proximal, occluding, middle and cervical thirds.

Right and left lateral incisors: Labial, lingual, grinding, central proximal, cuspid proximal, occluding, middle and cervical thirds.

Cuspids: Labial, lingual, occluding, lateral proximal, bicuspid proximal, occluding, middle and cervical thirds.

1st. bicuspid, right and left: Buccal, lingual, grinding, cuspo-proximal, bicuspo-proximal, bicuspo-fissure, buccal cusp, and lingual cusp.

2d. bicuspid, right and left: Buccal, lingual, grinding, bicuspo-proximal, molo-proximal, bicuspo-fissure, buccal cusp and lingual cusp.

First upper molars, right and left: Buccal, lingual, grinding, molo-proximal, bicuspo-proximal, anterior fissure, cross fissure, posterior-buccal prominence, anterio-buccal prominence, lingual prominence.

Second upper molars: Buccal, lingual, grinding; molo-proximal, third molo-proximal, central fissure, cross fissure, anterior-buccal prominence, posterior-buccal prominence, lingual prominence.

Third upper molars: Buccal, lingual, grinding, molo-proximal, posterior and central fissure.

Lower molars: Buccal, lingual, grinding, proximal, buccal-pit fissure, central fissure, lingual cross fissure, buccal cross fissure, posterior fissure, anterior fissure, lingual posterior prominence, lingual anterior prominence and buccal prominence.

A NEW SUBSTITUTE FOR BRIDGE WORK ORIGINALLY EXPRESSED.

Uppr plates that donot cover the roof of the mouth finding some that would not bear a plate in the roof of the mouth and beng for severable reasons unsatisfied with bridge-work, and as several of those mouths have no teeth to fasten to, I have been expirimenting with the following: I form my plate (whether uppr or under) to fit the alveolid ridge after the usual munner then either on the inside or outside or grnd into the side of the artificial teeth and drill a hole to the center of the alvaolia ridge near the bycispid teeth this hole I countersink, next I take a silver or some other noncorosive metal screw having one tapering end something like a small wood screw the other end is threaded like a common bolt to this end is fitted a nut to fit the countersink in plate, the nut is slotted screw-fashioned, said nut is operated in removing with a crotchet screwdriver next I take a pad bit the size of the body of the screw (it having a gage to regulate the debpth) next I place the plate in the mouth and retain it there, and with this bit placed in the hole in the plate I quickly remove a piece of the alviolia the size of the body of the wood screw end of the above screw next I remove the plate, syrange out the hole in the alvaolid and quickly incirt the screw, the thread of the screw imbeding into the alveolid, the plate is then placed in position over the ends of the screws that protrude the nuts put on and the job is complete, the alveolid heals around this screw and the mouth is healthier than it is with old roots in the jaw both sides of the plate are screwed after the above manner the thread an the bolt end should be cut well down that in case of shrinkage of the alvaolia the nut may be run down, with this fixture artificial teeth are nearly as firm and comfortable as the natural teeth.

Please publish as others may wish to exeperiment with the above.
MILFORD, Mich. W. D. BAUGHN.

Anticipating decay is better than removing decay; and removing it when in an incipient state and polishing the surface, is better than leaving it to produce a cavity.

Let the extraction of a tooth be a last resort, save it if it is possible. The more you try to save carious teeth,—even those with pulps exposed,—the better you will succeed.

WHERE DO TEETH MOST DECAY ?

DR. O. A. JARVIS, NEW YORK.

As may be seen by looking at the teeth, they are so constructed as to present depressions between the points or cusps in the crowns. The parts are not united as a solid mass at these places, and are sometimes imperfectly joined. The nutritive forces have failed to perfect them. Now these fissures present just the conditions to invite decay, by affording lodgment for foreign matter, and generating destructive acids. The patient is not in fault for this defect. While proper care may retard, or possibly arrest the destructive process, it is otherwise mainly beyond his control. The dentist is needed here, and will be till certain constitutional changes are effected in coming generations.

The next most vulnerable point of attack is between the teeth, just by the point of contact, on the proximal surfaces. It is comparatively seldom that teeth decay in any other places; the most frequent exceptions being at the cervix or neck on the buccal and labial surfaces; that is, next to the lips and the cheeks.

These depressions and fissures in the crowns, even if not accompanied by the imperfections spoken of, are calculated to afford lodgment for food, and matter from the mucus of the mouth, and it is protected by its position from disturbance. Being always warm and moist it readily undergoes those chemical changes which prove so destructive to the teeth. This is a satisfactory answer to the question as regards this class of caries, namely, those in the crowns.

Teeth decay between them because it is a very convenient place for the lodgment of matter, which, undisturbed, undergoes fermentation. The space is the form of a V, or a triangle, variably acute, its apex toward the crown of the tooth. In its normal state it is occupied by the gum. Decay never commences at the point where the two teeth touch, for the simple reason that even the slight movement of the teeth against each other produces sufficient friction to keep that exact spot clean and polished. But near by, at the acute angle, the mischief commences. How forcibly this tells what may be and ought to be done by artificial means; that is, keep *all* clean and polished. When the decay gets beneath the surface, the mischief is still farther protected from disturbance, and progresses without being detected by the owner, and the patient is not aware of its progress till it has become so weak on the inside as to break away on the outside. The patient is likely to declare that it has just commenced, when on the contrary it is very large, and the commencement dates back many years.

The cause of caries on the buccal and labial surfaces is perhaps as apparent. How often I lift the curtains (lips) and, showing the decay, with a hand-glass, say "please try to be a little more careful at those

places." The act of mastication is not so likely to *remove* matter from these localities, the lips and cheeks hold it there. A proper use of the brush would have kept off the evil. And yet the teeth are often injured on these surfaces by harsh brushing or coarse dentifrices.

So that, in brief: The greatest cause of decay in teeth is *neglect*.
—*The Dentist*.

THE DREAD OF HAVING TEETH FILLED.

TO THE TIMID.

"Why don't you have your teeth attended to?" is a question which perhaps many of my readers have had asked them many times; and generally the reply was—"Oh! I dread it so much—it hurts so!"

Now, I wish to say a few words about this terrible hurting, and dread of having operations performed on the teeth. And my object is, if possible, to remove this dread and apprehension from your minds, as I feel confident that I shall be doing a service to any one who may thus be induced to place himself in the hands of a competent dentist, should any such service be required.

If people generally could realize how much suffering they would avoid, by timely attention to the filling of their teeth—even allowing it does hurt as much as is generally feared—there would be no necessity for the writing of such an article as this. But few people do realize this, and so I am going to try, as I said before, to lessen your dread of these very necessary operations.

Don't you all know that the dread of suffering is always greater than the suffering warrants, when it comes?

Did any of you ever have a pain to bear, which you knew beforehand was coming, that you did not find very much less when it did come, than you feared?

Anticipation always magnifies sensations, both of pleasure and pain; and this is particularly true with regard to suffering, as connected with dental operations. The patient has such a great dread—anticipated, perhaps, for long months—of having anything done to his teeth, that finally, when he makes up his mind to submit to the necessary operations, his imagination is so wrought on, he really does suffer, though the dentist has not, perhaps, inflicted any real pain.

How frequently do patients start and shrink under the dentist's hands; when, on being asked if they suffer, reply—"No, but I thought it was going to hurt!" This is the very thing you should avoid! You must not think "it's going to," and generally you will find that it does not.

Upon examining a front tooth for a lady, the nerve was found to be exposed, and had to be removed. Now, I suppose you would all think that such an operation was very dreadful, and one you could

not submit to. Well, I prepared the cavity partially, and removed the nerve entirely, and after all pain was over, as I took up an instrument I had not before used, and which, probably, looked less pleasing to the lady than those I had before used, she started up with the exclamation—"Why, what are you going to do now? Are you going to take out the nerve!"

When I told her that the nerve *was* removed, she could hardly believe me; and yet such was the fact, and she had suffered no more than she could bear with perfect patience. But suppose she had known I was about to remove the nerve, do you not see how much greater her suffering would have been? and this extra suffering would all have come from her imagination. Thus, you see how much this "*dread*" has to do with your suffering.

As to the *real* pain attending the operation of filling teeth, you may be sure it is not very great, and it will generally be found, where the teeth seem unusually sensitive at the first touch, that the first cut of the instrument removes the most tender portion of the tooth, and the rest of the operation is conducted with little pain.

And here let me say, you should always employ a dentist in whom you can place confidence, as otherwise you will suffer more from apprehension, if not from real pain, besides doing yourself and the dentist an injustice.

A skilful dentist, who has the confidence of his patient, operates much more rapidly, and with far less pain to the patient, than he possibly could do, were the patient evidently distrustful of him, and nervous from apprehension and fear.

So you see, by putting away this "*dread*," and giving your entire confidence to your dentist, you insure yourself freedom from suffering, and a much more thorough and satisfactory operation. And this you can do, if you will, and much more easily than you think; and I am sure it is worth your while to make the effort, for the sake of preserving your teeth. I shall not present any of the manifold reasons why you should wish to preserve them, for they are so self-evident, all intelligent persons have a strong desire to do so, though frequently allowing them to be lost, from a groundless fear of the pain necessary to be borne in order to preserve them.

I hope I may have succeeded in placing this subject before my readers in such a manner, that some may be induced to give attention to their teeth, who otherwise might not. If I shall have thus succeeded even in a few cases, I shall be repaid, for I know they will thank me by and by.—Editorial in *Dental Journal*.

If you would have your business keep you, you must keep your business.

Chemical Affinity. Says one of our writers, "In the lowest kingdom we see each atom of matter with its correspondiug uses brought into play by *chemical affinity*."

We suggested to this writer the elimination of the word chemical, but this was objected to. We only refer to this expression as an example of the prominence chemical affinity is given as the cause of the productions, conditions, and workings of nature. We do not ignore chemical affinity, but wish to show there are other forces at work doing their important part.

Perhaps first among all is electricity. So universal is its presence, so varied are its actions, and so powerful are its effects, that, in the opinion of some scientists, it is *the* affinity, and that forces under all other names are but manifestations of this. We cannot explain it, nor its mode of operation, and are often puzzled even to explain its action; it is simply a something we call electricity,—so subtle is it we hardly know that it is a *something*, we only know its results. We speak of it as an affinity, but we see quite as much of its repulsion. It seems ever tearing down as well as building up, of dissolving as well as combining, of destroying as well as creating. It is as widespread as the heavens, doing wonderful things on the grandest scale, yes, and apparently flashing beyond the heavens and from beyond the heavens to us—more, controlling the very stars and commanding all motion; and yet in its delicate affinities, intimate and specific and beautiful in the formation, combination, and inseparable bond of the tiniest atom.

The greatest changes produced by the movement of water, often in great rivers beneath us as well as on the surface, are not chemical affinities. And are the capillary attractions and repulsions which so silently and delicately, and yet so efficiently work their wonders, chemical affinities? We used to speak of light and heat as chemical affinities, but now we speak of them as modes of motion. We might go on with quite a list of forces manifested in "the lowest kingdom" which it would be extremely difficult to couch under the term "chemical affinity."

For Alcoholism.—The following is commended by high authority:—

R	Tr. capsici.....	3	iiij
	Spts. ammon. aromat.....	3	iiij
	Tr. calumbæ.....	3	j
	Tr. card. co.....	3	vj
	Aquam ad.....	3	viiiij

M.—Fiat mistura. Sig.: A teaspoonful with the same quantity of water every two hours, or when craving for drink comes on.

A strip of tarred paper, such as roofers use, placed under the edge of a carpet is a sure preventative of moths.

Editorial.

WHAT IS A TOOTH?

Is'nt that a simple question? "Any one can tell what a tooth is." We are not so sure of that, though we do not mean to involve in an answer all its elements and component parts, but simply its general characteristics. Are you ready then to say you can certainly answer our question? Do not be too sure.

For instance, does a tooth look like a fish scale? If you were to see a slab of whale bone two or three feet wide and eight or ten feet long would you call that a tooth? As you chill, do you see those little elevations rise on your skin? look at them with a strong microscope, and you see, connected with these little papilla, minute scales. Do you ask what these have to do with teeth? There is not much difference between any of them in their origin, germ matter and growth, and the teeth; and even between the nature of the body of a full grown tooth and the fish scales, the whale bones, and the minute scales of our bodies.

Most vertebrate and invertebrate bodies have teeth, but they differ in appearance very much. Those great slabs of whale bone are but modifications of the whale's skin. And these rough, sharp, elastic crossing fibers in the whale's mouth act as a great sieve through which to force its barrels of water to sieve out its food, and then to act as its teeth to crush it. There are fish which show still more clearly this intimate connection between the skin and the scales on it, and the teeth. Take, for example, the dog fish. Many of its scales become so prominent as to be called spines. They cover the skin quite up to the lips. Look closely, and you will see, as the skin turns in and becomes the mucuous membrane of the mouth, these scales or spines grow smaller on the lips but further in they become so firm, rigid, and formidable, they may well be called teeth, and they show their sharp points in large numbers all over the mouth, and are used as teeth. Yet these are modifications of the skin of the mouth. No wonder the teeth are called dermoid appendages—of the nature of skin.

We thus see that, in many species of animals and fish, the teeth are not the distinct, enamel organs we find in man. In some they are elastic dentine; in others, hardly more than plates of gristle. In some they are sharp spikes; in others, formidable crowns of dentine and enamel on edge, so that, as the softer dentine becomes worn the edges of the flinty enamel stick up as sharp knives or in serrations like a saw. In some they are exceedingly few, perhaps only one and that a huge tusk, or at most one in each jaw apposing, or closely passing by each other; in others almost countless, covering maxilla, mandible, palate,

and even pharynx. In some they are sharp delicate needles poised in the gum in rows, as though stuck in rubber, and as food is brought into the mouth they lie backward almost flat on the surface and then immediately become erect to hold its prey from escape; in others they are fewer but mighty in size, strength, and power to crush.

ANCIENT DENTISTRY.

In the ITEMS OF INTEREST for last March we criticised an article in the *Independent Practitioner* by Dr. J. G. Van Marter on this subject. The Doctor had found in the museum of Corneto, Italy, two specimens of partial sets of artificial teeth. Though under lock and key, he was able to make a drawing of them, which he presented. One was a band of soft gold designated by Dr. Van Marter as "a partial denture, after the plan of what we now call bridge work, and made as an arrangement for holding in position three superior artificial teeth." "In the drawing, the cuspid and lateral incisors were natural teeth, while the two central incisors were evidently carved from some large animal's tooth to fit the space." "The missing artificial first bicuspid, and the adjoining natural tooth had crumbled to dust when the relic of human misery was unearthed." These specimens were supposed by Dr. Van Marter and Dr. Barrett to be about 2500 years old.

Our criticisms on this find were, among other things, that,

1st. The proof of their age was not clear, as it was founded only on the assertion of the mayor of Corneto, and his opinion was based on what he had heard from persons who had no personal knowledge of their history.

2nd. That England claimed to have in its museums specimens of dentistry equally ancient the history of which was no more definite.

3rd. That we must take with some allowance what purports to be the history of specimens found in museums.

It now transpires that in the museum of Liverpool there are specimens identical with those Dr. Van Marter found in Italy. "These precisely resemble the specimens illustrating Dr. Van Marter's paper," says Dr. W. H. Waite of England, who borrows them of the museum there to show them in this country. And the detailed description given them by this gentleman is almost word for word, the same as the description given by Dr. Van Marter of his.

Dr. Waite says: "Those of you who read the *Independent Practitioner* will remember that in the month of January there appeared an article from Dr. J. G. Van Marter on the subject of Prehistoric Dentistry, and that it was illustrated by diagrams of specimens supposed to have been found in Etruscan graves. Dr. Barrett wrote me that he believed there was such a specimen in a museum in Liverpool, and asked me to look it up. After a little trouble I found there were two specimens in

the Brown Museum, at Liverpool. I think I promised to examine the specimens and write an article for the *Independent Practitioner*, but when I made up my mind to come over to this country, I thought it would be more interesting if I could get possession of them, and exhibit them to you personally. It was a very difficult thing to do this, and it was only after a very considerable amount of correspondence that I succeeded in getting them. I was obliged to give a very heavy guarantee that they should come back. I have them here in a little box with a glass lid, where they may be seen by any gentlemen who may wish to look at them. They are supposed to have been found in an Etruscan grave; they are prehistoric, and therefore we can have no record of their age."

Which is the genuine find, and which the imposition? both claim to be the original. And, have we a reliable history of either?

A TRUTH EXAGGERATED BECOMES A FALSEHOOD.

Dr. Moore, in the *Independent Practitioner* says: "I have seen nothing in the journals advising against the employment of gutta-percha as a capping for exposed pulps, while much has appeared urging its use both as a capping and as a non-conductor under metal fillings. I therefore utter a note of warning. It is a well-known fact that gutta-percha possesses sufficient expansive qualities to make it a valuable agent in separating teeth. We have all observed this property, in a marked degree, when buccal cavities have been filled with it. No matter how carefully the work has been done, or how neatly and smoothly the material has been packed, a few months later we are sure to find it bulging from the cavity to such an extent as to make us feel as if we had used at least a fourth too much material. This same change takes place when it is used over an exposed pulp, and confined under a filling. Sufficient pressure is exerted to produce inflammation and death of that organ.

"When used as a non-conductor under large metallic fillings it will, in almost every case, expand to such a degree as to force the filling out, even if it has to fracture the walls of the tooth to do it. We can most heartily recommend it as a root-filling, but in such cases the roots should be filled with gutta-percha, and the pulp-chamber with gold, or some of the cements."

It is true, gutta-percha expands, and for this reason it is a good filling for a tooth, unless it is placed in a part exposed to trituration, and even there it may be covered with metal. A piece of plate gold with three or four points turned down to enter the gutta-percha as an anchorage and the face formed to fit the cavity, makes a durable filling. Instead of shrinking, as some manufactories of amalgam does, it swells just enough to make a tight filling. This swelling does not continue for months, as Dr. Moore says, so that finally "we are sure to find it bulging from the cavity to such an extent as to make us feel as if we had used at least a fourth too much material." This is non-

sense. We do not like it as a cover for exposed pulps ; its little expansion makes it sometimes infringe on that sensitive membrane. But even in this use of it it is not generally an evil, because the medication of the pulp before filling the cavity, and even its depletion by bleeding, before the cavity of the tooth is filled, generally causes the pulp to shrink away from the filling, and thus give ample space for the swelling of the gutta-percha. If there *is* infringement it is almost immediate, and is quickly known by the pain it causes. Our preference for a capping is a chloroform solution of gutta-percha, which covers the pulp with such a thin layer there is no expansion. Simply chalk mixed with a solution of gum arabic makes a good covering. Place it on a small piece of stiff writing paper and carry it to its place, chalk downward to the pulp. Either this or the gutta-percha film should be followed by oxyphosphate ; this in turn to be covered by metal. Red rubber dissolved in chloroform is also good to cover the pulp.

One of the reasons Dr. Flagg gives in his Quiz Questions why men have better teeth than women is that they chew tobacco.

And yet women will not chew. What obstinate creatures they are. Perhaps it is because these men will not tolerate the practice in women. Ah, these men are selfish beings, I always knew they were. They want to monopolize this savory morsel to their own use. Why is it our fair sex do not quietly creep up behind their liege lords and, as they take a bite of their pig tail whisper, "*Me too ?*" Or as their superiors sit by their side and, with so much grace and dignity, squirt their tobacco juice into the corner, why do not these sisters, wives, and sweet-hearts snatch a precious quid and "*chaw*" too? These women are silly creatures to let their teeth rot, when by reducing to pulp between their teeth a five-cent plug of tobacco per day would give them as nice, clean, white teeth as these tobacco chewers have. They might get behind the door, or stealthily crawl into the husband's library while he was gone—or visit Prof. Flagg. Would not these stolen opportunities of delicious chewing be a delightful way of cleaning their teeth? Think of it, you fastidious girls. It would do away with the necessity of using good, sensible, hard food, and the tooth brush. Ah, the precious pig tail ; how it saves the teeth of a man from decay ! And yet he will give none of it to his wife ! The ungrateful wretch. So he chews and spits, and spits and chews the precious quid, *to save his teeth ?* And yet his anxious spouse remains unfed, though with such pitying sobs she cries "*Me Too !*"

It is said a man can starve to death without experiencing hunger by eating clay.

"A PLAIN TRUTH WELL EXPRESSED."

Dr. Barrett says: "Under the conduct of the men at present in control of the International Medical Congress of 1887, it cannot result in anything creditable. There will be very few, if any delegates in attendance from abroad, and it is fortunate for us that the dental section has been dropped. We desire to repeat very emphatically:—*unless there be a change in the administration of affairs, we as dentists shall only lose in dignity and standing by having anything to do with it.*"

We like that—even its italics. But, Dr. Barrett, you must remember, "A too liberal use of italics is an insult to the intelligence of the reader." Perhaps you little thought when you quoted thus from *Salmagundi*, against a correspondent of the ITEMS, you were an equal transgressor.

Note your "insult to the intelligence of the reader" in your "liberal use of italics" in speaking of Dr. Miller's views, as expressed in the last International Medical Congress as given below: You give "a plain truth well expressed"—that is, in our view—but in your judgment, "it displays a lack of confidence in the reader, to say nothing of the fact that such means are frequently employed to give prominence to certain parts, so that the reader will not notice the dearth of ideas." You say:

"1. The first step in the etiology of dental caries is an almost *complete* decalcification of the tissue by acids, resulting in the case of enamel, in its entire destruction.

"2. Following the decalcification, (often far behind it) is the destruction of the *decalcified* tissue by micro-organisms.

"3. The fact that an artificial caries identical with natural caries may be easily produced, renders untenable the idea that inflammation is necessary to caries.

"According to Dr. Miller, there remains to be solved the questions: *What is the acid or acids of caries? How is it produced? Do fungi produce or help to produce it? If so, what fungi, and how is their development in the mouth to be hindered?*"

We think, from friend Barrett's *practice*, his and our use of italics do not differ; but we editors *do* like to get a point on one another, don't *we*?

Is the cicatrice of the gum weaker or stronger than the normal tissue? Quiz Questions by Prof. Flagg says where the gum is lanced and heals over, the cicatricial tissue is weaker than the uncut surface. We think it is stronger and tougher; and this makes an objection to lancing, unless we are pretty sure the tooth will come through before the surfaces of the cut can knit together.

A MODEL SENTENCE—A CRITIC CRITICISED.

An esteemed contemporary in speaking of some remarks made by another on "A Model Sentence," says: "Surely it is not too much to expect that upon due study of these same remarks they [dentists generally] will at once qualify themselves by careful carrying out of the writers views, and themselves become one and all 'model dentists.'" And this editor is one of the leaders in English literature, and specially as he is here modeling a sentence criticising "a model sentence," it is supposable he has done his best in constructing it.

This editor may think it necessary to write "upon" for on, but we cannot see why. That word "due" is made to serve many meanings. What is a "due study?" Why not say a proper or sufficient study? Then that trite phrase, "one and all," instead of saying "become one and all model dentists" why not say and *become model dentists*? That awkward English word *themselves* for they, and sometimes when it is entirely superfluous is another singular expression for a literary editor. Hear him "and themselves become one and all model dentists." Read the whole sentence and see how awkward and how superfluous it is.

We hope we give no offense; but really do we give enough attention to clear diction? We wish we were an adept at terse writing; we are only aiming at it, through much stumbling and many blunderings. Perhaps a little good natured criticisms on a "a model sentence" may do us all good. We dare not even whisper the thought that there is anything ungrammatical in the editor's sentence. If we could catch his attention privately we would ask him if "careful" would not sound better with an *ly* added; and if, "carrying out of the writers views," would not sound better without the *of*; and if writer's views would not be an improvement on *writers views*.

WHOLENESS OF CHARACTER.

Some men tread so long and so laboriously in a deep rut—labor so exclusively in one direction—they are of little worth anywhere else. By overworking certain muscles or faculties, and leaving others unused and undeveloped, they lack nobleness, sympathy, wholeness of character; and they become prematurely old and decrepid. They know nothing of the elasticity given by recreation, nor of the healthfulness, usefulness, and happiness imported by judicious avocations. They consume time, strength, and life in one continuous round of stern, hard work, in one undeviating channel.

For men to be skilled in some special calling, is commendable; but if the exercise of the mind and the interests of the life are confined there, so that all other qualities of character and usefulness be-

come dwarfed, of what use are they to the world above mere beasts of burden?—of what pleasure are they to themselves? They are slaves.

The man of narrow sphere has narrow views, distorted judgment, and selfish feelings. His reasonings on general subjects will be biased, and his character so unbalanced he cannot be relied on in great movements for the world's advancement. He takes no interest in them; for in his seclusiveness, he becomes blinded to everything not in the immediate line of his narrow vision, and he is indifferent to the good or happiness of all who do not contribute to his special advancement.

Because he cannot see his general ignorance, he becomes puffed up with the little he does know of a special character; because he does not mingle with the better classes, he becomes egotistic and self-wise; and because he shuts his eyes to the great panorama of the world's progress passing by him, he thinks he is in advance of his fellows.

Let us not be of this class. To be of the greatest benefit to this world, in fact, to have the greatest enjoyment in it, and make the best of it, for the present and for the vast future, requires wholeness of character. It will not do to be simply a minister, a lawyer, a tradesman, or a dentist. We must frequently throw off our special garb, and be men—men among men—exercising the qualities common to humanity. We must interest ourselves with what interests the world at large; and thus, while we do good to others we shall get for ourselves breadth of view, largeness of heart, and nobleness of sympathies.

As dentists, if we go out thus among the wise for wisdom, among the genial for inspiration, and among the suffering to beget within ourselves mellowness, generosity and kindness, which only personal contact, sympathy, and sacrifice can give, we shall come back to our special vacation, in every way better prepared to pursue it. We shall have new vim, fresh skill, and a lighter heart. Its tasks will be easier, its vexations less annoying, and its perplexities more patiently solved; the day will be brighter, our patients more patient, and our surroundings more genial.

Yes, and with this wholeness of character we shall make better husbands and fathers, better companions and friends, and better citizens. The brightness of such a character will bring sunshine everywhere, the geniality of such a spirit will make friends of everyone, and the harmonies of such a life will be better than medicine to rouse the faint-hearted, to calm the fearful, and to soothe the suffering.

Shall we leave the stumps in? We see by our English exchanges it is the custom of many there to leave in as many stumps of teeth as possible when preparing for artificial teeth. They are excised, instead of extracted, and the root cavities filled; sometimes the stump is capped with gold. What is the experience of American dentists?

RESERVE.

There is a reserve growing out of pride, coldness, or an evil heart. Then reserve, instead of being a merit is to be despised. 'Tis but the stealthy crawling of the loathsome snake as it draws near to wind about you its slimy coils. If it is the reserve of pride, it may show itself in an unwillingness to confess a wrong we know justice demands, or an assumed dignity which prevents our doing what we are conscious is due to a benefactor, or a contemptuous haughtiness toward those who depend on us for support, sympathy, or affection.

The reserve which comes from constitutional coldness is still worse. There is hope that pride may be broken, and that, when humility follows, reserve will give way to confession, restitution, and sympathy; but a constitutional coldness—what will cure it? What will make it tolerable? What will compensate for it? If a warm nature leans against it chills to a shiver throughout every fiber; the surrounding atmosphere is damp and frigid as from an iceberg.

When this reserve is begotten of evil thoughts and wrong doing, it is still worse. The iceberg only gives coldness—but in the atmosphere polluted by vice we are surrounded by a depressing miasmatic fog that pains us to the very marrow, and warns us that we are in the vicinity of the clammy coldness of death. Instinctively we seek the clearer, healthier, purer air of a higher altitude.

But there is a reserve begotten of pure modesty. The more sincere we are in looking at our own defects, or in comparing what we are with the virtue and attainments of our superiors, the more diffident we become in advancing our opinions or in taking prominent positions. At best we are imperfect, erring, blundering beings; and if we soberly examine ourselves, no one knows this better than we do. If our real character was laid bare, would there not appear even more than blemishes? When we hear men loud in self-praise, we fear that either they do not know themselves or that they are hypocrites—that their self-laudations are either the art of pride or the cunning of some sinister design.

In our conventions and other professional gatherings, it is not always the foremost to speak and act who are the wisest. The brain of some is so small it will contain but few ideas, and these not of much importance—and yet it is so pressed for utterance it would burst if not allowed to relieve itself. If such persons could see themselves as others see them, they would ask some one to hoop their heads that it might not be necessary for them to make fools of themselves.

But because some make themselves bores is no reason why others should allow modesty to keep them reticent when they have really valuable thoughts to impart. If we have something important to say, it is as much our duty to say it, as it is for those who have not, to be quiet.

Then there are those who are reserved because they are not fluent in speech. Some of our best thinkers and operators are of this class. These persons would find it of great benefit to themselves and others to speak as occasion requires. They are generally fluent in conversation, and by patient practice, would soon become so in a more formal speech.

The very meaning of the word reserve implies that we keep something to ourselves. It is well that we do, for that would be a queer state of society where all which is in everybody's mind and heart should be made public. Then too, most good thoughts become important only as they are reserved for growth, maturity, and suitable time and place for expression. Let us be first sure, therefore, that we have thoughts worth reserving, and then, that we have discretion in placing them where they belong.

THE FIRST YEARS' COURSE FOR DENTAL STUDENTS.

The dean of the University of the Maryland Dental Department, says that school cannot join the National Association of Dental Faculties, because this association forbids instruction to first year students in operative dentistry. The Dean's reasons for teaching operative dentistry during both years is cogent. He says: "The Faculty of the University of Maryland Dental Department deem it inexpedient to join the National Association of Dental Faculties, for the reason that they believe the present curriculum of study, etc., in the University of Maryland to be superior to any graded course of study, such as is obligatory upon all dental schools joining your association, for the reason that it (the graded course) restricts the junior students to the study of dental mechanism alone, for the one session of the two comprising the full course, to the exclusion of operative dentistry, and therefore affords dental students the advantage of but one session in the acquirement of a knowledge of a branch of our science for which the time of two sessions is not too long. The Faculty of the University of Maryland Dental Department contend that students in dental schools should have all the advantages possible of the *two* sessions in *operative* as well as in mechanical dentistry, and that the adoption of such a graded course as that required by your association, and which restricts the dental student in the manner referred to, must be *retrogressive* instead of progressive in dental education.

How to increase the action of an anesthetic. Dr. Bonwill says it is a fact, testified to by many, that it takes a minimum quantity of an anesthetic to produce unconsciousness, if the patient has first breathed rapidly, immediately before taking the anesthetic.

Miscellaneous.

ORIGIN OF COAL.

[Extract from editorial in *Problems of Nature*.]

A coal seam is a straight bed of coal extending from near the center of a hill, or mountain, toward the surface of the upheaval, and always parallel with the rock that is above and below it. The seam is always given a gradual decrease in thickness from the wide side in the center of the mountain to the outside of the mountain. Every seam is the same in these particulars. A good exhibition of a charred splinter of a rock, is it not?

We do not want a reply till we are through with our description. The most convincing fact that coal is but charred coral rock is found in the fact that a crater of the mountain is never filled with coal. A coal seam is never found extending through the middle of the mountain. A good idea of a folly of a fashionable scientist is obtained, by inquiring why a mud washed over a fallen forest of ferns, as claimed by a bigot of our school books, has a hole through it in the middle, and a gradual decrease of its thickness as it extends from the hole; and why there are several layers of mud, and all united around the hole. What a proposition for a person who claims to be a teacher of science!

Let it be seen as plainly as possible. A coal formation, as it is admitted to exist by every one, is a ring of the substance of considerable thickness around the crater of a mountain, and extending from the continuous coal on the surface of the crater, or the general mass, in all directions in as many flanges as there are on a common screw, which are gradually decreased in thickness, as the threads of the screw are, till they reach the surface of the mountain. A screw with very wide threads horizontally extending (if this could be called a screw) would give a complete picture of a coal formation, assuming the body of the screw to be hollow.

The fashionable scientist informs his listeners that this formation of coal is performed by a washing of mud and sand over a fallen forest of ferns. Who can blame us for denouncing such egregious folly?

Without commenting on the fact that a forest of ferns was never prostrated on a mountain's territory, or washed over by mud and sand anywhere, it is quite sufficient to call our reader's attention to the facts given. No person with a particle of sense can fail to see that the claim of the bigot is a folly of the most inexcusable character, and a disgrace as well.

No mountain exists on the surface of the globe that was not given an existence by a breaking up of a coal reef under a shore of a body of salt water. A coral cannot be found grown in fresh water; a few hills of some few hundred feet in height have been pushed up on the interior of a continent, or island, but every instance of this kind has simply been a swelling of the soil that was filled with a decaying mass of small plants—a *hive* on the body of the earth, and capable of complete cure. Let us be contradicted if possible. Old Jorullo, of Mexico, is a great hive on a plateau of coral rock. A cartman can take it all away in a lifetime. A car-load of the soil an hour will remove it in a year.

Let us be understood as stating that a mountain of rock does not exist on any part of the globe, that is not a broken mass of coral rock that extended once under a salt water. The evidence of this is so plain it can be observed by a savage if pointed out to him.

Now if a coral reef was the substance of a mountain when it was broken up, how could a forest of ferns become buried under its debris? A scientist is sure to say, "Why you are mistaken about a mountain being a broken and upheaved coral reef, it is a piling of the crusted waves of a fiery globe, and pushed up when the pile was large enough." This is exactly what the most famous geologist of the country is teaching every day in a college of grand distinction, and in his books.

Do our friends blame us for comparing a fashionable scientist to a buck goat on a rock he cannot comprehend, or to an ass? It is not to do a single individual of this class of people an injury that we are giving them a fruition of their teaching. If it was we should give our victim's name. We care no more for the personality of these teachers, than we do for the butterflies that infest a lady's wardrobe.

It is a wholesale misleading of a growing generation that gives us a determination to blast every folly.

Now let us ask again if a coral seam can be produced by a washing of mud and sand over a fallen forest of ferns?

A bare burning of the rock by a current of electricity, that poured out the crater of a mountain, and which produced the upheaval, was the operation that produced every particle of coal on or in the earth.

To cure a cold—Pour about half a pint of boiling water over a dram of pulverized camphor, and inhale the vapors ten to twenty minutes. Great relief is at once experienced, and after two or three repetitions the discomfort is said to disappear entirely.—*El Siglo Medico*.

Printed Matter may be copied on any paper of an absorbent nature, by dampening the surface with a weak solution of acetate of iron, and pressing in an ordinary copying press. Old writing may also be copied if wet with a weak solution of sulphate of iron mixed with a small solution of sugar syrup.—*Paper World*.

A cement which is proof against boiling acids may be made by a composition of India rubber, tallow, lime, and red lead. The India rubber is first melted by a gentle heat, and then 6 to 8 per cent of tallow is added to it, and kept stirred; next day slaked lime is applied till the fluid mass assumes the consistency of soft paste; lastly, 20 per cent of red lead is added to make it harden and dry.

For sharpening tools, instead of oil, which thickens and smears the stone, a mixture of glycerine is recommended. The proportions of the composition vary according to the class of tools to be sharpened. One with a relatively large surface is best sharpened with a clear fluid, three parts of glycerine being mixed with one part of spirits. A graver having a small cutting surface only requires a small pressure on the stone; and, in such cases, the glycerine should be mixed with only two or three drops of spirits.

STEPPING STONES TO SUCCESS.

Learn your business thoroughly,
 Keep at one thing—in no wise change.
 Always be in haste, but never in a hurry.
 Observe system in all you do and undertake.
 Whatever is worth doing at all is worth doing well.
 One to-day is worth two to-morrows.

Be self-reliant ; do not take too much advice, but rather depend on yourself.

Never fail to keep your appointments, nor to be punctual to the minute.

Never be idle, but keep your hands and mind usefully employed except when sleeping.

Use charity with all ; be ever generous in thought and deed—help others along life's thorny path.

Make no haste to be rich ; remember that small and steady gains give competency and tranquility of mind.

He that ascends a ladder must take the lowest round. All who are above were once below.

Think all you speak , but speak not all you think :
 Thoughts are your own ; your words are so no more—
 Where Wisdom steers, wind cannot make you sink ;
 Lips never err when she but keep the door.

MEDICAL ADVICE.

Take the open air,
 The more you take the better.
 Follow Nature's laws
 To the very letter.
 Let the doctors go
 To the Bay of Biscay,
 Let alone the gin,
 The brandy and the whiskey.

Freely exercise—
 Keep your spirits cheerful ;
 Let no dread of sickness
 Ever make you fearful.
 Eat of simple food,
 Drink of pure cold water
 Then you will be well—
 Or at least you *oughter*

What' ll you have?—Beer is more dangerous than whisky. That is the verdict of the *Scientific American*, which sets forth that the use of beer is found to produce a species of degeneration of all the organs ; profound and deceptive fatty deposits, diminished circulation, conditions of congestion and perversion of functional activities, local inflammations of both the liver and kidneys, are constantly present. A slight injury, a severe cold, or a shock to the body or mind, will commonly provoke acute disease ending fatally in a beer drinker.

What Mr. Gould likes to eat.—" I am very fond of baked potatoes," said Mr. Jay Gould, the other day. " They are about the simplest thing one can eat, and I find that the simpler my food is the better for my head. At home I do not care for what you call 'fancy dishes.' Plain meats and vegetables, good bread and butter, good milk, sometimes porridge or grits for breakfast, satisfy me. As you may suppose, I find my time filled up pretty well with business, and I certainly find that I can get along better when my food is the plainest of the plain. I have never lost my fondness for the country food I used to be accustomed to in my boyhood.

To preserve steel instruments from rust.—1. The oil of india rubber is said to have proved efficient in preventing rust, and to have been adopted by the German army. It only requires to be spread with a piece of flannel, in a very thin layer, over the metallic surface, and allowed to dry. Such a coating will afford security against all atmospheric influences, and will not show any cracks under the microscope after a year's standing. To remove it, the article has simply to be treated with caoutchouc-oil again, and washed after twelve to twenty-four hours.

2. A solution of india rubber in benzine has been used for years as a coating for steel, iron, and lead, and has been found a simple means of keeping them from oxidizing. It can be easily applied with a brush, and is as easily rubbed off. It should be made about the consistency of cream.

3. All steel articles can be perfectly preserved from rust by putting a lump of freshly burnt lime in the drawer or case in which they are kept. If things are to be moved (as a gun in its case, for instance), put the lime in a muslin bag. This is especially valuable for specimens of iron when fractured; for, in a moderately dry place, the lime will not want any renewing for many years, as it is capable of absorbing a large quantity of moisture. Articles in use should be placed in a box nearly filled with thoroughly pulverized slaked lime. Before using them rub well with a woollen cloth.

4. Soft soap, with half its weight of pearlash; one ounce of mixture in about one gallon of boiling water. This is in every-day use in most engineers' shops in the drip-cans used for turning long articles bright in wrought-iron and steel. The work, though constantly moist, does not rust; and bright nuts are immersed in it for days, till wanted, and retain their polish.

In the manufacture of glass fifty years ago 28 pounds of potash and 26 pounds of wood ashes were used to every 100 pounds of sand. The first change from this was to burn the potash in an oven, and work it as a puddler does iron, in order to obtain better results, and this was used with lime in about the same proportions as potash and wood ashes above named. Soda ash was first used in New Jersey, but its introduction in western factories was very rapid, and the mixture was changed to 33 pounds of soda ash and 26 pounds of lime to 100 pounds of sand. The proportions vary greatly with circumstances and the quality of the ingredients used. The following is a fair statement of the mix now mostly used: Soda ash, 40 pounds; lime, 30 pounds; sand, 100 pounds. For salt cake, 33 pounds; soda ash, 10 pounds; lime, 33 pounds; pulverized charcoal, $2\frac{1}{2}$ pounds; arsenic, $1\frac{1}{2}$ pounds; sand, 100 pounds. If the glass is muddy the charcoal is reduced. If too green charcoal is added and arsenic reduced.

Insoluble Cement from Glue.—In order to render glue insoluble in water, even hot water, it is only necessary, when dissolving glue for use, to add a little potassium bichromate to the water and expose the glued part to the light. The proportion of bichromate will vary with circumstances; but for most purposes about one-fiftieth of the amount of glue will suffice.

TO GET RID OF COCKROACHES.

A correspondent writes as follows: "I beg to forward you an easy, clean, and certain method of eradicating those loathsome insects from dwelling houses. A few years ago my house was infested with cockroaches (or 'clocks,' as they are called here), and I was recommended to try cucumber peeling as a remedy. I accordingly, immediately before bedtime, strewed the floor of those parts of the house most infested with the vermin with the green peel, cut not very thin, from the cucumber, and sat up half an hour later than usual to watch the effect.

Before the expiration of that time the floor where the peel lay was completely covered with cockroaches, so much so that the vegetable could not be seen, so voraciously were they engaged in sucking the poisonous moisture from it. I adopted the same plan the following night, but my visitors were not nearly so numerous—I should think not more than a fourth of the previous night.

On the third night I did not discover one; but anxious to ascertain whether the house was quite clear of them, I examined the peel after I had laid it down about half an hour, and perceived that it was covered with myriads of minute cockroaches, about the size of a flea. I therefore allowed the peel to remain till morning, and from that moment I have not seen a cockroach in the house. It is a very old building, and I can assure you that the above remedy only requires to be persevered in for three or four nights to completely eradicate the pest. Of course it should be fresh cucumber peel every night.—*Confectioner's Record*.

Eatables on Ocean Steamers.—Few persons are aware of the extensive nature of the victualing on board the great ocean steamers. Such a vessel is provisioned as follows for the passengers and crew: 3,500 pounds of butter, 3,000 hams, 1,600 pounds of biscuits, exclusive of those supplied for the crew, 8,000 pounds of grapes, almonds, figs, and other dessert fruits; 1,500 pounds of jams and jellies; tinned meats, 6,000 pounds; dried beans, 3,000 pounds; rice, 3,000 pounds; onions, 5,000 pounds; potatoes, 40 tons; flour, 300 barrels; and eggs, 1,200 dozen. Fresh vegetables, dried meat and live bullocks, sheep, pigs, geese, turkeys, ducks, fowls, fish and casual game, are generally supplied at each port, so that it is difficult to estimate them. Probably two dozen bullocks and 60 sheep would be a fair average for the whole voyage, and the rest may be inferred in proportion. During the summer months, when traveling is heavy, 25 fowls are often used in soup for a single dinner.

Xylonite. One of the most remarkable of recent products is xylonite. It is made by first treating a fine tissue paper with sulphuric acid and then with alcohol and camphor. The paper becomes like parchment, and may be worked into plates of any thickness and made transparent or colored brilliantly. It is much more flexible and less brilliant than horn of ivory.

A putty of starch and chloride of zinc hardens quickly and lasts as a stopper of holes in metals for months.

ITEMS

—OF—

INTEREST.

The Dental Independent.

T. B. WELCH, M.D., EDITOR.

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We send this number of the ITEMS OF INTEREST to some who are not subscribers. Examine it, and see if you would not prize its monthly visits. The subscription is but a trifle, but we are confident you will find the contents of each number a valuable aid to your practice. When we contemplated its present form, we were urged to put it at two dollars; and if our friends could see how hard we worked to make it interesting, they would say we earned the two dollars. But we were determined to make its price so low that all who prized it should not feel it a burden to take it. In this way we have obtained a large circulation, and by keeping up the value of the journal we have been pretty sure to retain all we have obtained.

That you may not delay sending us your subscription for 1886, we will send you the December ITEMS free, if you remit your dollar now. As a professional man, can you spend a dollar to better advantage?

You will observe, the principal purpose of the ITEMS OF INTEREST is to gather the richest thoughts of the profession and place them before its readers in the most distinct and concise form. We have original contributors who appreciate our effort, and give us their most matured experience, in a terse, clear style; and we spend much time in gathering valuable thoughts from all sources. From our highly appreciated contemporary journals we gather much of value.

We believe our success proves that the profession needs just such a journal, and that they appreciate our labors in supplying it. Reader, if you will be of our company, we will do you good.

"LETTERS TO A MOTHER FROM A MOTHER."

I have read with great interest, in THE SOUTHERN DENTAL JOURNAL, a series of letters, "To a Mother from a Mother," on the *formation, growth and care* of the teeth. If there is a dentist who has neglected to read them, he should avail himself of the opportunity. These letters were written by the wife of a dentist, Mrs. M. W. J. These are not her true initials, but we know who she is, and we are proud of her as a Southern lady who is willing to wield her pen for the good of the profession and humanity. Oh, that we could have more mothers that are as well educated in *anatomy, physiology and hygiene!*

It is time that we and the medical profession should impress it upon the public mind that these studies should be taught more thoroughly in the public schools and colleges. Students thus taught would probably soon become parents, and as parents they would feel a deep interest in their children's welfare, physically, as well as mentally and morally, and such well-meant advice, kindly proffered, couched in proper terms, and coming from a competent source, would never be rejected by a sensible child.

D. L. BOOZER,

Pres. South Carolina State Dental Society.

These letters are now on sale at the Dental Depot at 25 cents.

WELCH DENTAL Co., Publishers.

We look forward to the coming of each number of the ITEMS with more anticipatory pleasure than to the coming of *any other* journal, dental or otherwise.

Yours,

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English Teeth for Bridge-Work.

It is only necessary to say that these are **THE TEETH** for Bridgework, and we have a good selection, and will give careful attention to orders.

PRICE, 10 cents per tooth.

English Pinless Teeth.

Order these teeth with the full assurance that they are well adapted for fitting and articulating, and will prove stronger than pin teeth. Dentists have long been asking for pinless teeth, and here they are, wonderful in appearance and wonderful in price.

Order if you think they may do and we refund the money if you doubt their value. **PRICE, 5 cents per tooth**, in sets of 6s and 14s.

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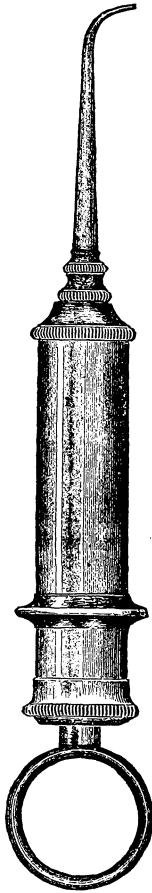
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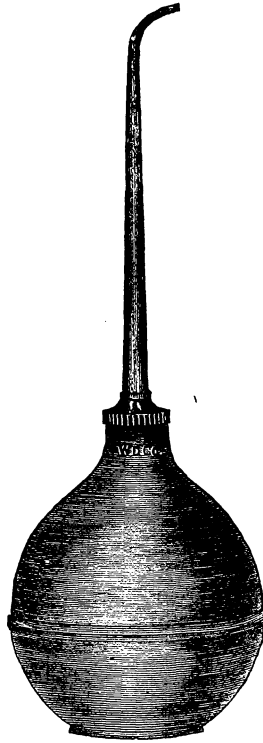
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29 Sets for.....	25.00	Partial Sets.....	8 cents per tooth

CAVITIES DRILLED to order in artificial teeth for 50 cts. per cavity. We make good shaped, bevel-edged cavities, with plenty enlargement to hold the filling.

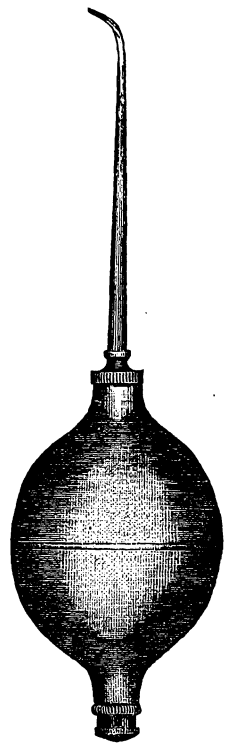
SYRINGES.



Nickeled Brass.
All Metal Syringe.
Length, 6 inches.
\$1.25



Rubber Bulb and Nickeled Brass.
No. 1 Chip Syringe.
Length, 6½ inches.
\$1.00



Rubber Bulb and Nickeled Brass.
Valved Chip Syringe.
Length, 7¼ inches.
\$1.00

WELCH VULCANIZERS.

Enlarged, Improved, Reduced Prices.—A Vulcanizer Outfit consists of Boiler, Cover, Thermometer, Wrenches (both hand and bed-plate wrenches), Flasks, Jacket and No. 1 Union Oil-Stove or Gas Burner. Everything complete for use.

Two-Flask Vulcanizer Outfit, gas, alcohol or Kerosene.....	14 00
Three-Flask Vulcanizer Outfit, " " ".....	15 00
Two-Flask Boiler, cover, thermometer and wrenches.....	10 50
Three-Flask Boiler, cover, thermometer and wrenches.....	11 00
Brass Flask, the improved.....	1 50
Brass Flask, the improved, extra size.....	1 75
Iron Flask, the improved.....	75
Iron Flask, the improved, extra size.....	1 00
Union Kerosene Stove, one burner.....	1 50
Union Kerosene Stove, two burners.....	2 00

Dr. Welch's Filling Materials.

Dr. Welch's Gold and Platina ALLOY.

This Alloy is prepared for filling the same as Amalgam, except that it takes less mercury. Use as little mercury as will make a stiff plastic filling, then, without washing, hasten to the cavity. The gold and patina cause it to harden quicker than ordinary Amalgam, and also give it superior qualities. It has a finer grain than Amalgam, more completely resists corrosion, and in an incredibly short time becomes so hard that sharp angles do not break away.

1 oz. \$3.00; 2 ozs. \$5.50; 4 ozs. \$10.00.

Welch Dental Co.

NO. 1413 FILBERT STREET,

Philadelphia

Dr. Welch's Gold and Platina Alloy has had more good words from good dentists than any filling in the market. We could publish a volume of letters testifying to its good qualities.

This Alloy is not filed or chipped as is generally done, but is reduced to very thin SHAVINGS, and is free from particles of iron. We also reduce some of these shavings to "FINE ALLOY," as some prefer this form. Either form takes mercury very readily.

Put up in one-half and one ounce packages. See accompanying label for price and directions.

DR. WELCH'S PHOSPHATE OF ZINC,

Price. large bottles, \$1.50, either Powder or Liquid Separate, 75 cents.

This superior Zinc Filling has had a wonderful sale, and the demand is increasing, because of its valuable properties.

With the directions that accompany each box, we believe dentists will find this the most satisfactory filling of the class.

WELCH'S GOLD FOILS.

Soft and Cohesive, Nos. 4, 5, 6, 10, 20, 30, 40 and 60.

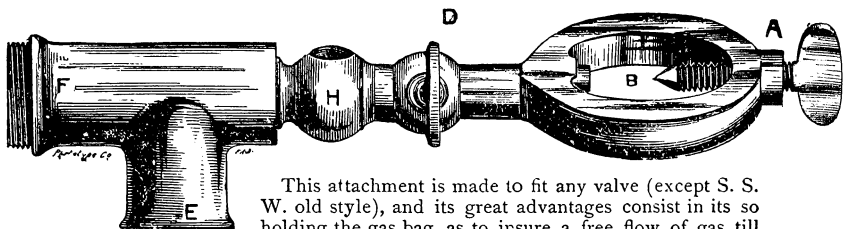
1-10 Ounce, \$3.00. 1-2 Ounce, \$14.00

We do not hesitate to offer these soft and cohesive foils to the Profession as Gold which will stand the test every time. They cannot fail to please, and we wish every dentist in the country to use them. You will like them and you will order again. We refund the money to any one not liking our Gold.

DR. WELCH'S SUPERIOR GUTTA PERCHA FOR TOOTH FILLING.

Quarter ounce, 50 cents; Half ounce, \$1.00; One ounce, \$1.50

THE NEW GAS ATTACHMENT

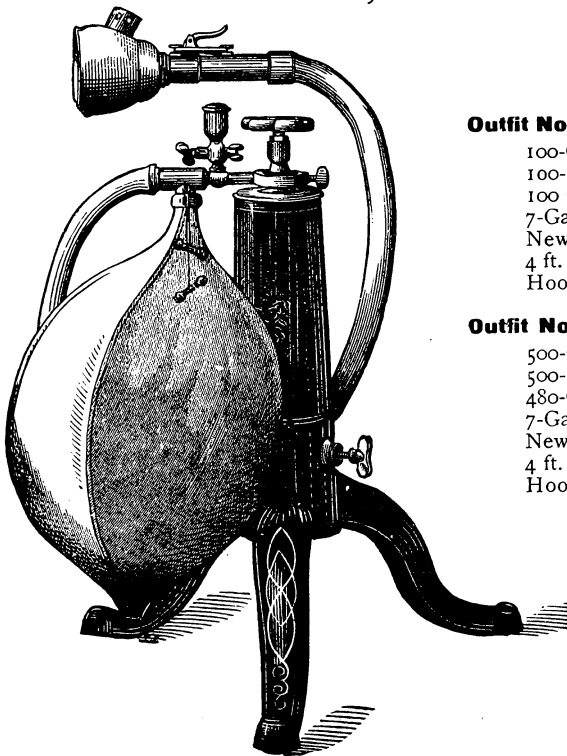


This attachment is made to fit any valve (except S. S. W. old style), and its great advantages consist in its so holding the gas bag, as to insure a free flow of gas till the bag is entirely empty. With the old style (see cut of outfit No. 3), with the bag on the floor, it often collapses at the neck before it is empty, and, too, the bag is in the way, and wears out sooner.

D is a stop cock that admits of removing the bag and attachment, for operating in another place. At E the gas bag is tied with fine wire or string. The gas in coming from the cylinder passes down E to fill the bag, and when operating, the gas passes out E and through F. At F the tubing is attached. If the tubing is flexible rubber, stretch it over F. If covered tubing, we furnish a connection that fits the screw at F. G is the cup or measure for adding a measured and known quantity of Ether or Chloroform to a bag of gas. The cup screws on the attachment at H.

Price of Attachment, \$4.00 ; Price of Cup and Instructions, \$4.00 ;

GAS OUTFIT, Nos. 6 and 7.



Outfit No. 6—\$32.00

100-Gallon Stand.
100-Gallon Cylinder,
100 Gallons Gas.
7-Gallon Bag.
New Attachment.
4 ft. Covered Tubing.
Hood Inhaler.

Outfit No. 7—\$50.00.

500-Gallon Stand.
500-Gallon Cylinder.
480-Gallons Gas.
7-Gallon Bag.
New Attachment.
4 ft. Covered Tubing.
Hood Inhaler.

SURFACE COHESION FORMS,

(FOR ARTIFICIAL DENTURE.)

For Rubber, Celluloid, Gold AND Platinum Work.

Dr. T. F. Chupein, Clinical Instructor, Pennsylvania College of Dental Surgery writes: "Dr. Jos. Spyer, New York, a lady patient had lost her upper back teeth on the left side from the cuspid to the third molar, all of her front teeth were intact and the back ones also on the right side as far as the first molar. She wished a small plate that would not cover the roof of the mouth. I had misgivings as to the success of the case, but I am pleased to tell you that she wears the plate made by the use of the 'Cohesion Surface Forms,' and expresses herself as being quite satisfied. She says the plate does not move or come down or fall while talking, laughing or eating."

Dr. E. B. Goodall, inventor of Goodall's Spring Plate and Goodall's Forceps, sums up his experience with "Spyer's Cohesion Surface Forms" as follows: "I have used 'Spyer's Cohesion Surface Forms' with very practical results, and I am doing finely with the 'Forms,' particularly for plates on the *lower jaw*." They stick beautifully and do not irritate the mucous membrane half so much as the old way by reason of *non* tilting and holding more firmly in place."

Dr. William H. Johnston, Chairman Ex-Committee of the Second District Dental Society of the State of New York, says: "I have finished using one box of 'Spyer's Cohesion Surface Forms,' and I can say that they have given me the greatest satisfaction."

Dr. R. M. Griswold, Hartford, Conn., writes: "I have used 'Spyer's Cohesion Surface Forms' and am pleased with the success I have had with several sets of artificial teeth that promised to be worthless."

Dr. C. A. Smith, Oneida, N. Y., says: "I have used one dozen of 'Spyer's Cohesion Surface Forms' and like them very much."

By the use of this surface plate or form a much smaller plate can be made, as the cohesion is over the whole surface of the plate instead of at only one point, as in the central-air or suction chamber. By the use of this Surface Cohesion Form the inner surface of the plate is covered with semi-oval Projections that causes the plate to hold firmly to its place, without producing irritation, and without leaving perceptible indentations on the membrane, and without dulling the sense of taste. The Minute projections on the inner surface of the plate are pressed with the tissues of the gum. Around the base of these projections there is practically a continuous channel or opening so that the moment the edge of the plate is removed or loosened, the entire surface of the latter is relieved. This Form or Plate is placed on palatal surface of the cast, the last thing before packing with rubber or celluloid. (Rubber Cement is used to fasten the form to the cast). The Form or Plate being of bright, non-corroding metal, leaves the plate with a beautiful finished surface. For Gold, Platinum or other metal the Cohesion Form is cemented to the palatal surface of the cast, molded in sand in the usual way, and three zinc dies and counter dies are made and plates swaged up. It is believed that this system will introduce a new era in prosthetic dentistry. Put up in boxes of 1 doz. each, with full instructions, for \$1.00 per box. Patented by DR. J. SPYER. For sale wholesale and retail by DR. SPYER, or WELCH DENTAL CO.

EUREKA CEMENT.

For sealing the joints of Gum Sections in rubber plates. This is the only cement that will bring out a Black Rubber Plate without rubber forcing through or discoloration showing between the joints. Prepared exclusively for plate work. Works easy and smoothly. No waiting for cement to harden. The more you vulcanize it the harder it becomes. Sample package will seal joints of 12 sets, 25 cts.; large package will seal joints of 75 sets, \$1.00. Sold by all dental depots and the manufacturers, Buck & Co., Brockport, N. Y., U. S. A.

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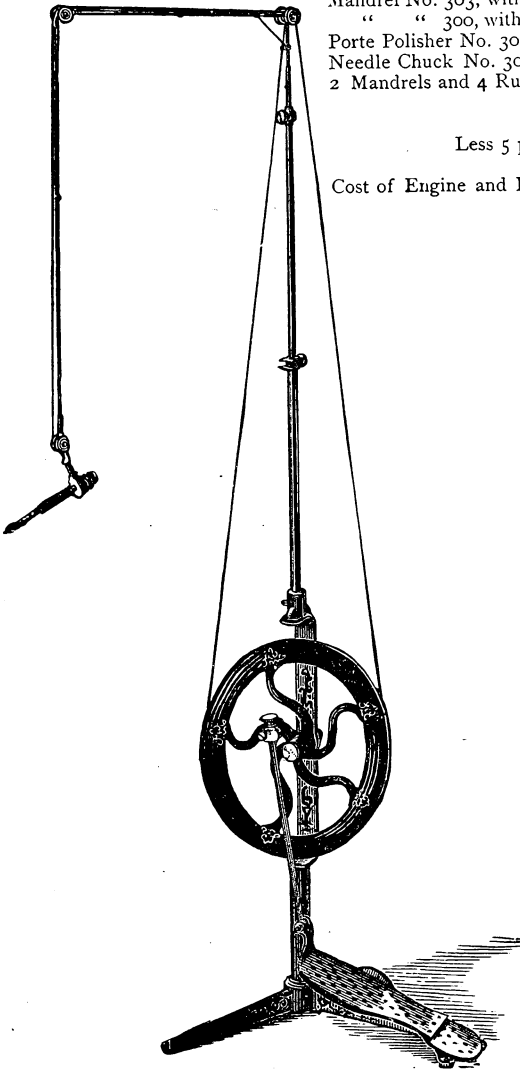
Bonwill Dental Engine.

Engine, with New Hand Piece.....	\$44 00
24 Excavating Burs and Drills.....	3 00
Mandrel No. 303, with Disk.	50
“ “ 300, with Stump Cor. Wheel,	17
Porte Polisher No. 307 and Wood Pts....	50
Needle Chuck No. 308.....	1 25
2 Mandrels and 4 Rubber and Cor. Pts.	60

\$50 02

Less 5 per ct..... 2 50

Cost of Engine and Equipments.....\$47 52



The New Bonwill Hand Piece.

CUT EXACT SIZE.

Price \$10.00.

TRADE SUPPLIED.

WELCH DENTAL CO., GENERAL AGENTS,
1413 Filbert Street, Philadelphia.

THE BONWILL DENTAL ENGINE.

No Cables to Break. Has Large Drive Wheel.

Its marked distinction from all others consists in a driving-wheel of thirteen inches diameter, and heavy rim, with crank-piece further from the center, giving more power to the foot. The small pulley on the hand-piece is but five-eighths of an inch in diameter, which at full speed gives 6000 revolutions per minute, with the foot never moving uncomfortably fast, or causing the body of the operator to be thrown out of equilibrium.

It combines the greatest strength with its great minuteness and delicacy and is little liable to get out of order or get broken from actual use.

The difference to the patient is very marked when the tool is placed on the tooth with slow or fast motion, besides the safety to patient from the additional security offered by positive revolutions. Tools cut with regularity, and are less liable to break or slip. It requires much less pressure to make them cut, and, consequently, is less painful.

With the new hand-piece, Dr. Bonwill stakes his reputation, and with the mechanical mallet attached will place it in competition with any engine and mallet combined. Besides, as now arranged, he can, at trifling expense, convert the dental into surgical engine, with a speed of 12,000 revolutions.

THE NEW BONWILL HAND PIECE, PRICE, \$10.00.

The greatest improvement ever made to the Engine Hand Piece.

It has compound chuck. No jarring or pounding, nor running backward or forward will loosen the burs. It is not dependent for its grip upon any arbitrary, patented slots in the bit. A plain wire, an inch long, is retained absolutely, and no danger of being loosened. One third of a turn of the nut releases or binds the bit.

Has the smallest nose of any hand-piece.

It is the cleanest hand-piece. Half a turn of a screw and the mandrel can be removed for oiling. No oil can get out upon the hands nor upon the bur. No saliva, water or grit can get into the working parts to make them wear or rust.

Each part can be duplicated if broken, which latter is hardly possible. No screws to get lost. May be taken to pieces by any dentist, and be sure to be put together correctly. There is nothing delicate or complicated.

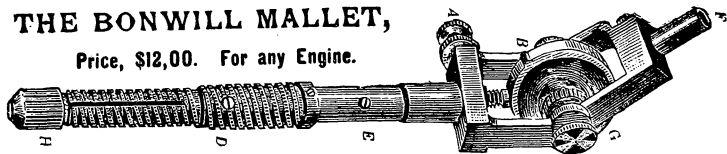
It will doubly pay for itself each year in economy of bits.

It takes any of the right angle attachments without alteration.

If Bor Bonwill engine, send the old hand-piece and connection.

THE BONWILL MALLET,

Price, \$12.00. For any Engine.



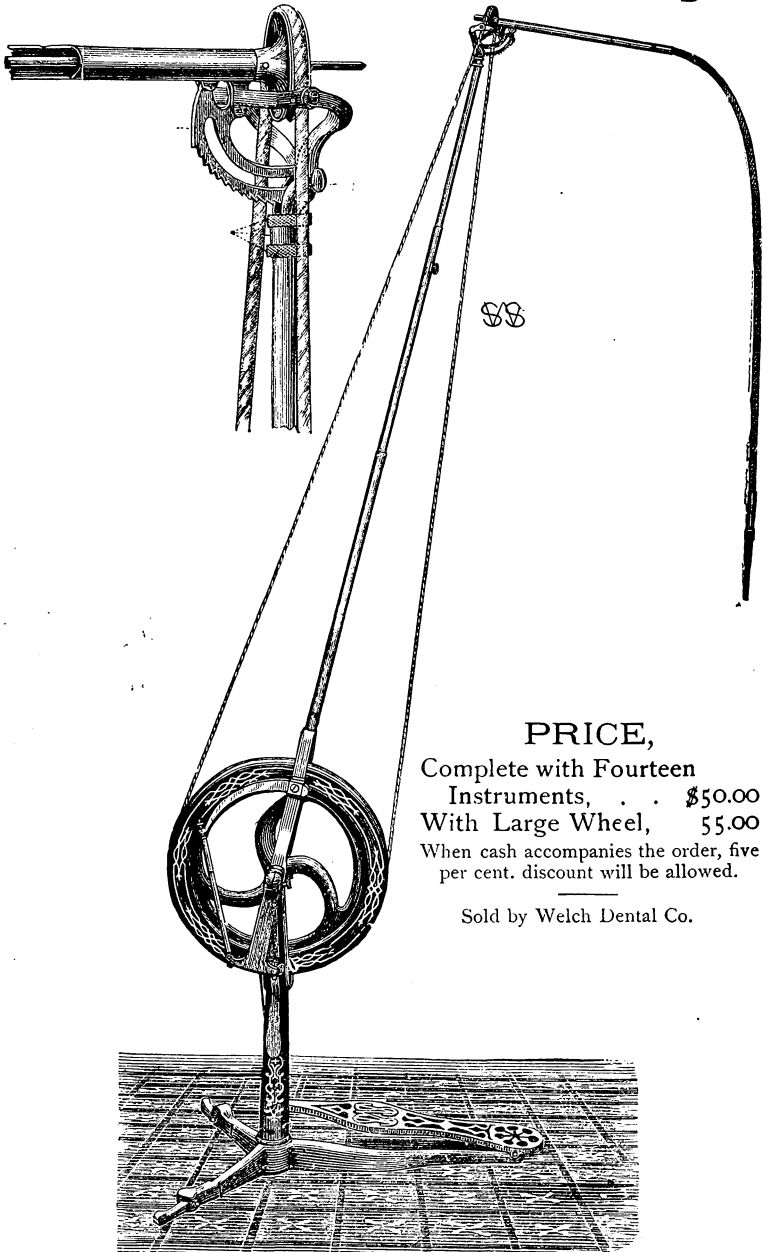
The instrument has been tried most faithfully for six years, and has given the most perfect satisfaction.

The very best and earliest friends of the ELECTRIC MALLET (by the same inventor) are now using the mechanical in preference. One of the most prominent operators said a few days since that \$1000 could not induce him to part with his mechanical mallet.

It can be attached to any engine, though it is far steadier on the Bonwill engine arm. It will strike as many blows per minute as the electric; can be used as a hand plugger. Has the dead blow of the lead mallet. It does not merely rap on the surface of the filling but penetrates the gold. Does not tire the foot or interfere with the position at the chair. Allows you to sit during the operation. Gives a hard blow instantly by increasing the speed of the driving wheel. Works at an angle of 45 deg. When used with the Bonwill engine the hand-piece is removed, and there is no extra weight on the hand.

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The S. S. White Improved Dental Engine.



PRICE,

Complete with Fourteen

Instruments, . . . \$50.00

With Large Wheel, 55.00

When cash accompanies the order, five
per cent. discount will be allowed.

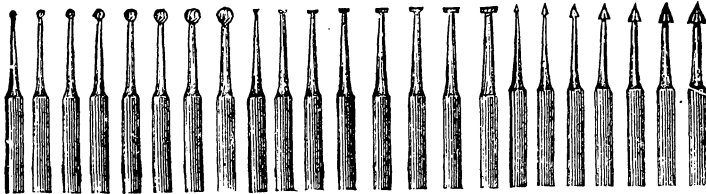
Sold by Welch Dental Co.

We furnish the above with the Universal No. 7 Chuck Hand-Piece,
instead of No. 6, when desired.

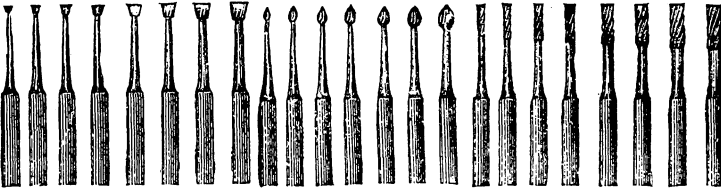
ENGINE EQUIPMENTS.

Extra Engine Burs and Drills, Warranted,.....	\$1.50	per dozen.
Honed Extra Burs,.....	2 00	"
Cone Journal Burs, reduced to.....	2.25	"
Cone Journal Drills, ".....	2.00	"

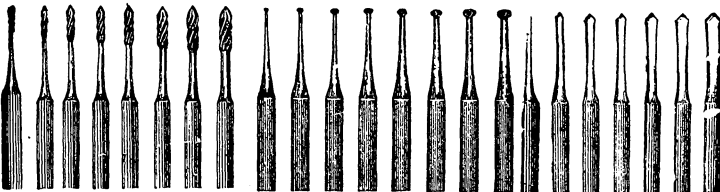
Right Angle Burs and Drills at same Price.



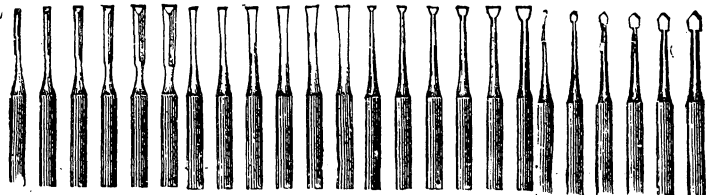
¾ 1 2 3 4 5 6 7 11½ 12 13 14 15 16 17 18 22½ 23 24 25 26 27 28



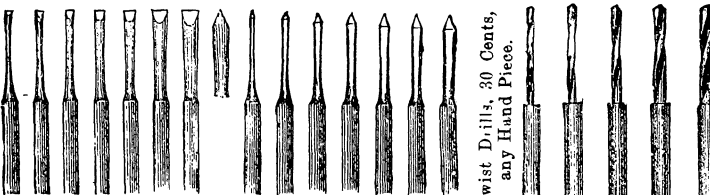
83¾ 34 35 36 37 38 39 40 44½ 45 46 47 48 49 50 55½ 56 57 58 59 60 61 62



63½ 67. 68. 69. 70. 71. 72. 73. 88½ 89. 90. 91. 92. 93. 94. 95. 100 101 102 103 104 105 106



107 108 109 110 111 112 114 115 116 117 118 119 121 122 123 124 125 126 128 129 130 131 132 133




135 136 137 138 139 140 141

142 143 144 145 146 147 148


*Twist Drills, 30 Cents,
any Hand Piece.*

150 151 152 153 154


ENGINE EQUIPMENTS.—Continued.




No. 300. 7 cents each.
Screw Mandrel, without Shoulder.



No. 301. 20 cents each.
Screw Mandrel, with Shoulder.



No. 302. 25 cents each.
Parting-Nut Mandrel.




No. 303. 25 cents each.
Screw-Head Mandrel.



No. 306. 25 cents each.
Porte-Polisher, Screw Socket,



No. 307. 30 cents each.
Screw-Clamp Porte-Polisher.



No. 308. \$1.00 each.
Needle-Chuck

This chuck is designed for carrying very fine retaining-pit drills made from sewing-needles. It will grasp and hold firmly any size not larger than No. 10.

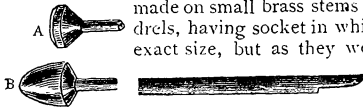
RUBBER AND CORUNDUM DISKS.

These Engine Disks are made of the best Sapphire Corundum mixed in Vulcanized Rubber. They will outwear a dozen ordinary corundum disks, and are far superior to anything made for separating the teeth, for cutting down gold fillings, and for articulating artificial teeth. They have all the advantages of corundum and shellac disks without the breakage and wear. Price, 25 cents each. Mandrel (No. 303), 25 cents.



RUBBER AND CORUNDUM POINTS.

These are of same Composition as our Disks. These points are made on small brass stems that admit of easy mounting in plain mandrels, having socket in which the stem is shellaced. The cuts show exact size, but as they wear down, other sizes are formed. They may be used till but a pin head is left, being very desirable in some cases. Price, 10 cents each. Mandrel, 10 cents.



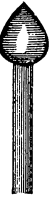

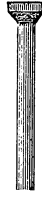


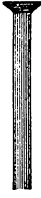


Bonwill Eng., New Hand Piece,	\$44.00
S. S. White Engine,	50.00
Johnston Engine,	40.00
Bonwill Surgical Attachment, .	20.00
Hand-Piece, New Bonwill, . . .	10.00
“ “ S. S. W., No. 6,	10.00
“ “ Universal, No. 7,	10.00
Right Angle, for any Hand-Piece,	5.00
Bonwill Mallet, for any Engine,	
with set of 9 points,	16 00
Sockets for Bonwill Mallet, to take	
Automatic Points,50
Oil, Decarbonized, very fine, . .	.25
Cable, for S. S. W. Engine, . . .	1.50
Sleeve, for “ “ “ “	2.50
Bands, for S.S.W. or Johnston Eng.	.10
“ for Bonwill Engine,25
Tooth Brush Wheels,20
Wire Wheels,40
Soft Rubber P'ts. for Polishing, each	.07

Soft Rubber Disks, for Polish'g, each	.10
Wood Polishing Points, per box	1.00

Cone Journal Burs, &c.

Burs, ordinary sizes, doz.	2.25
Burs, Fissure “	2.25
Drills, “	2.00
Twist Drills, each	.30
Flexible Burs, “	.35
Flexible Drills, “	.30
Morey Nerve Canal Drills50
Talbot Reamers, “	.40
Brewer Drills, “	.40
Plug Fin. Burs “	.40
Burnishers, “	.50
Corundum Points, Mounted “	.12
Rub. Cor. Disks & mandrel “	.50
Rub. Cor. Points, mounted “	.25
Needle Chuck, “	1.25

WOOD POLISHING POINTS.

100 Points in each Box.							
							
1	2	3	4	5	6	7	8
One Box, Assorted. \$1.00							
No. 1, Separately, per box 1.50							
No. 2, " " 1.50							
No. 3, " " .75							
No. 4, " " 2.50							
No. 5, " " .75							
No. 6, " " .75							
No. 7, " " 1.50							
No. 8, " " .50							

REPAIRING FORCEPS.

Forceps having one beak gone or mostly gone cannot be repaired.

Forceps that are rusty and need no repairing of the beaks will be polished and nickel-plated, and returned as good as new, for 50 cents each.

Slight filing or grinding of the beaks and nickel-plating, 60 to 75 cents each.

Broken beaks that can be repaired by drawing the temper and re-forging, the cost will be 75 cents to \$1.00, including nickel-plating.

Changing the forms of beaks and nickel-plating as new, 75 to \$1.00. It is very often that we are asked to change forceps to a form that the size of the forceps and the amount of material will not permit.

REPAIRING BURS AND DRILLS.

Engine Burs or Hand Burs, repaired equal to new, 75 cents per dozen.

Plug Finishing Burs, \$1.50 per dozen.

Engine Burs, repaired and honed to lancet-like edge, \$1.50 per dozen.

Engine Drills, made from old Burs and old Drills, repaired for 75 cents per dozen.

REPAIRING EXCAVATORS.

Excavators repaired to an assortment of hatchets, hoes, and rights and lefts, 75 cents per dozen.

Excavators repaired to specified numbers in catalogue, \$1.00 per dozen.

Excavators blued and made to look like new, 25 cents per dozen, extra.

REPAIRING PLUGGERS.

Pearl and Ivory Handle Pluggers, \$2.50 per dozen.

Steel Handle Pluggers, with ordinary points, \$1.50 per dozen.

Automatic Points, ordinary, \$1.50 per dozen.

Varney and other fine points, \$3.00 per dozen.

Changing forms of Plugger Points to specified catalogue forms, from \$1.50 to \$2.40 per dozen.

RUBBER DAM AND APPLIANCES.

Rubber Dam, medium, per yard...	\$1 50	Rubber Dam Punch, plain handle..	\$ 40
" " thin, " ..	1 00	" " " engraved " ..	50
" " Applier.....	1 00	" " " triplex ..	1 00
" " Clamps, each.....	60	" " " Ainsworth, N.P.	3 50
" " " Forceps.....	2 00	" " " Weights, with spring.	50
" " Holders, plain	60	Floss Silk, per doz	09
" " " Horn guards	1 00	Waxed Floss Silk, 2 spools in 1...	20
" " " Ivory guards	1 50	" " " per doz.....	2 25

WE WANT Gold Foil Scraps. We need them for our gold and platina alloy, and allow \$1.05 per dwt. For platina plate and pins we allow 35 cents per dwt. For gold plate we allow 72 cents per dwt. Put your name and address on every package you send by mail. WELCH DENTAL CO., Phila.

Forceps.

ADAPTATION,
—QUALITY,—
FINISH.

We know what is desirable and necessary in Extracting Forceps, and we excel in the above points—and our Forceps meet the various demands of the Profession.

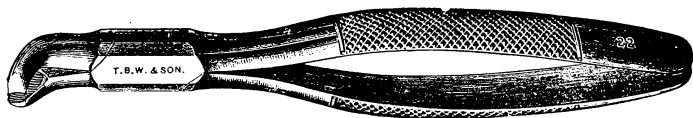
EVERY PAIR GUARANTEED.

First Quality, Octagon Joint, Nickelplated, \$2.50 per pair.

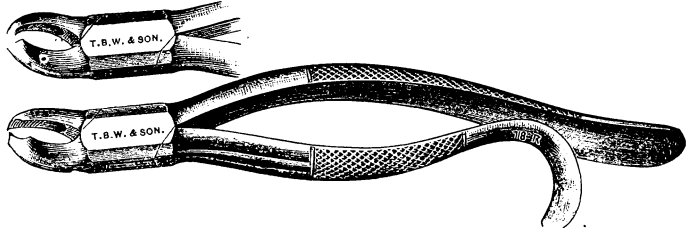
SENT FREE BY MAIL. ORDER BY ANY CATALOGUE.

Our Star Forceps are made from good material, but are not so highly finished. We guarantee them.

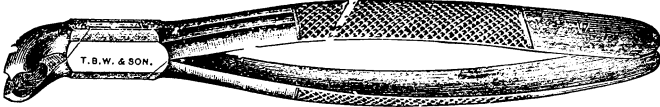
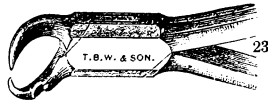
Star Forceps, Octagon Joint, Nickelplated, \$ 2.00 per pair.



No. 22.—Wisdom, Lower, Moffat's Pattern.



No. 18.—Molar, Upper, Right and Left, Harris Pattern, two pairs, Handles for both curved on same side.

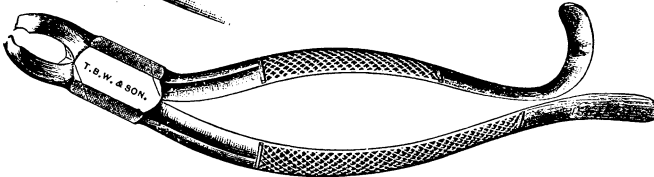
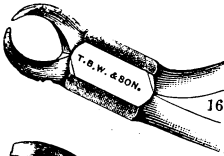


No. 17—Molar, Lower, Pointed Beak, either side.

No. 27—Molar, Lower, Plain Beak, either side.

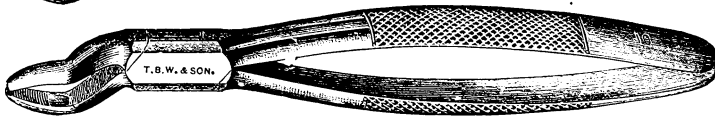
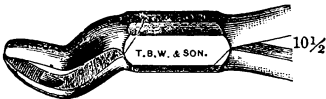
No. 23—Molar, Lower, Cow Horn Beak, either side.

These Forceps differ only in Beaks.



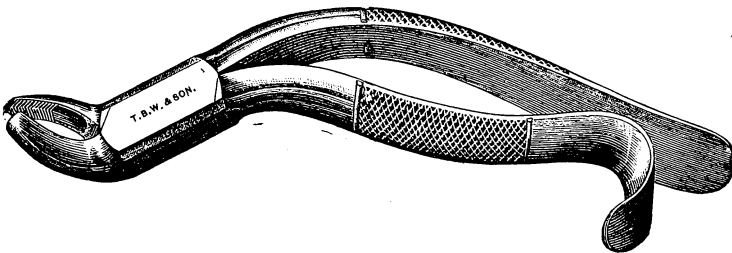
No. 15—Molar, Lower, Pointed Beak, Harris Pattern, either side.

No. 16—Molar, Lower, Cow Horn Beak, Harris Pattern, either side.

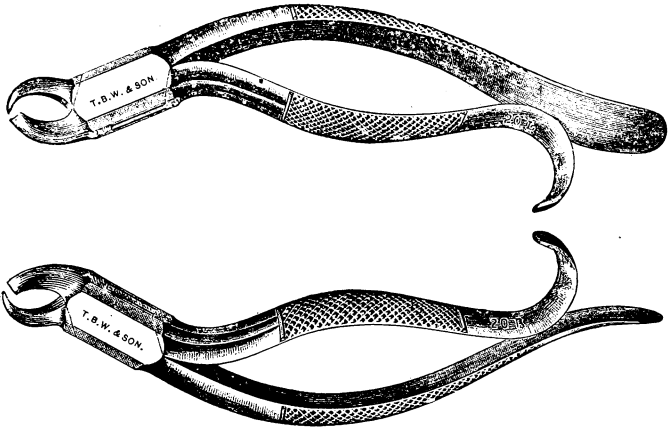


No. 10—Wisdom, Upper, either side, with or without Curved Handles.

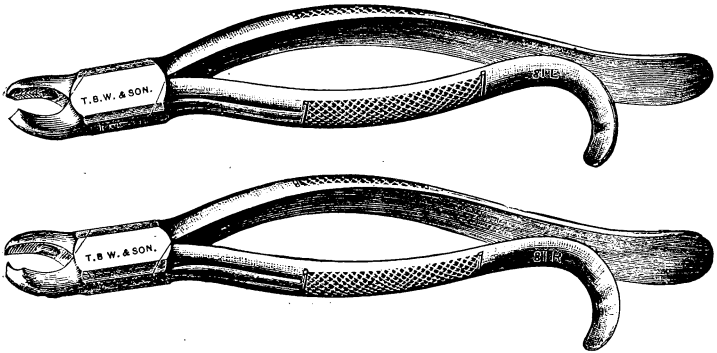
No. 10½—Wisdom, Upper, Moffat's Pattern. Beak more at acute angle than in No. 10. These Forceps differ only in Beaks.



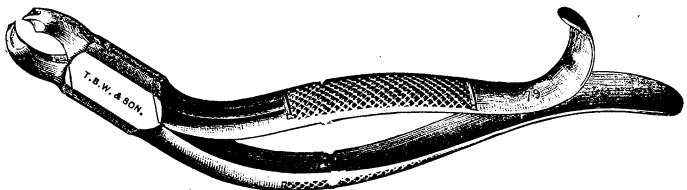
No. 19—Molar, Upper, Right and Left, two Pairs, Beaks like No. 18, Handles like No. 20. The above is Cut of 19 R.



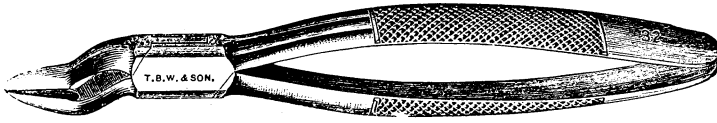
No. 20 — Molar, Upper, Cow Horn, Right and Left, two pairs, Curve of Handles on opposite sides.



No. 81.—Molar, Upper, Watling Pattern, Right and Left, two pairs.
“No. 81 Special,” Extra Heavy, (Price, \$300.)

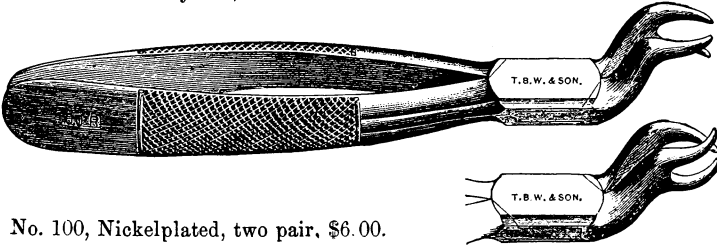


No. 79.—Molar, Lower, Watling, either side.
“No. 79 Special,” same as above, Extra Heavy, (Price, \$3.00.)



No. 32 Alveolar, Upper, Bayonet-shaped.

No. 35.—Root Bayonet, serrated beaks. Otherwise same as 32.



No. 100, Nickelplated, two pair, \$6.00.

To remove Upper Molars where the crowns are partially or completely broken away.

To the Dental Profession :

Inquiries are often made as to what is necessary for the dentist to do in order to secure a set of **Continuous Gum Work**.

Send a plaster cast, taken high all around, and especially over canine process. Make no changes in the cast. Describe condition of the surface. The plate will be swaged and returned to be tried in, with attention called to various points; arrange the teeth and return to be finished.

if

L. P. HASKELL,
125 State Street, Chicago.

Wants, For Sale, &c.

WANTED.—Every reader of the *ITEMS* to subscribe for "*Health and Home*" the only dental journal *published for the people*, subscription 50 cents including that excellent work, "*A Mother to Mothers*" as a premium; sample copy free; everybody is pleased with it. C. W. MUNSON, D.D.S., publisher, Toledo, Ohio.

FOR SALE.—Dental office and practice in a large town in Massachusetts at a junction of four railroads, surrounded by twelve towns without dentists, with aggregate population of 15,647 all of which patronize this town, only one competitor with limited practice. Practice \$2400 to \$3000 dollars per year; 96 artificial sets engaged; office of four rooms nicely furnished with Morrison & Archer chairs; gas apparatus, in fact everything usually found in a first-class office. Rent \$100 dollars per year; lease if desired; office established 1859; cause of sale failing health; best opening in the world for a good dentist. Price, \$800 to \$1000 dollars. Address, "DENTIST" care WELCH DENTAL CO.

WANTED.—A good competent dentist to take charge of my office, must be a graduate. Address. J. P. STRAYER, Ft. Scott, Kansas.

AN OPERATOR with four years experience wants a situation as assistant with a good dentist. Is a good operator, and capable of taking entire charge of office. Address, C. L. R., Lake City, Minn.

WANTED.—At once a competent young man as assistant in office and laboratory. Address stating terms, S. B. McCORMICK, D. D. S., 1050 Main street, Wheeling, W. Va.

EXCAVATORS.

OCTAGON, BLUED HANDLES, \$2.00 PER DOZEN.

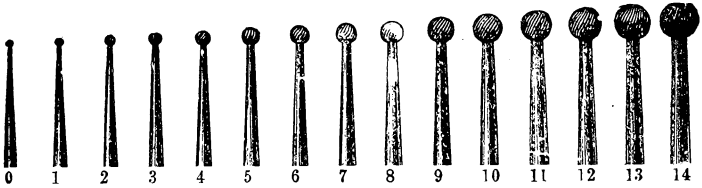
Ornamental Nickel-Plated Handles—for prices take Cone-Socket Handle No. 1 or No. 2, and add price of point desired.

HAND BURS.

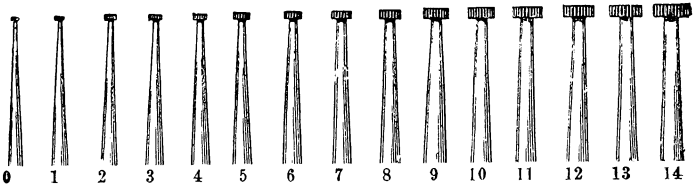
Octagon Blued Handles, per dozen.....\$2.00

Ornamented Handles, Nickle-plated, per dozen 2.50

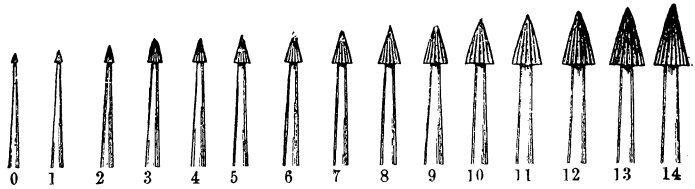
ROUND BURS.



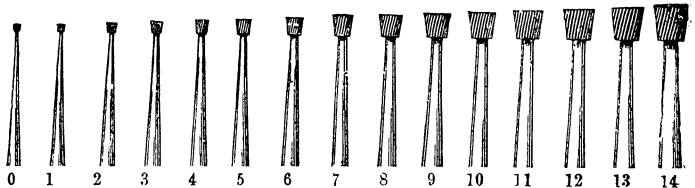
WHEEL BURS.



CONE BURS.



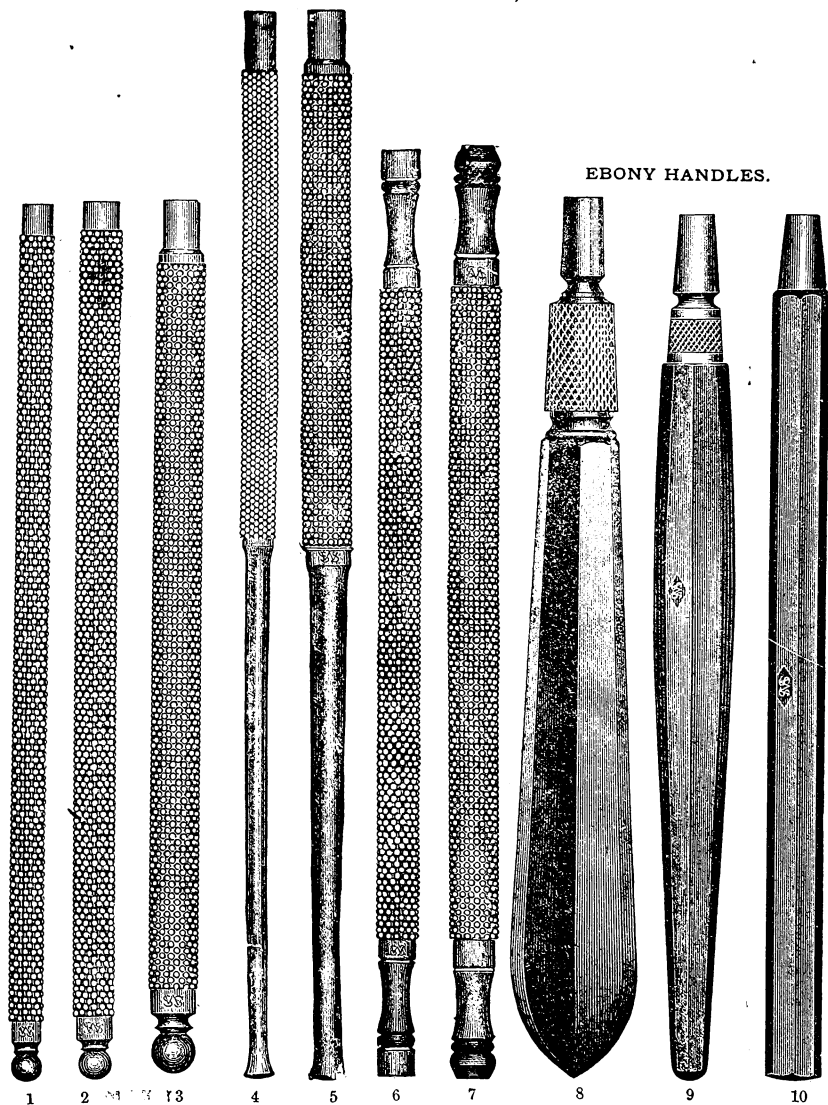
INVERTED CONE BURS.



(625)
HANDLES
FOR
CONE-SOCKET POINTS.

Patented November 16, 1880.

EBONY HANDLES.



\$1.50 per doz. \$2.50 per doz. \$4.00 per doz. \$3.00 per doz. \$7.20 per doz. \$5.00 per doz. \$3.00 per doz.

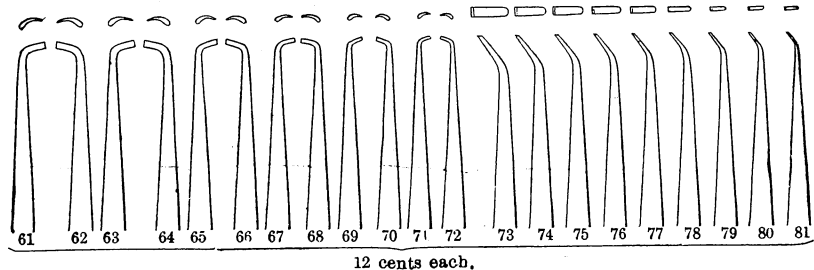
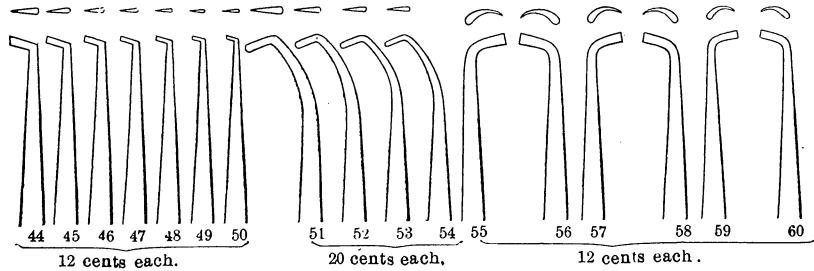
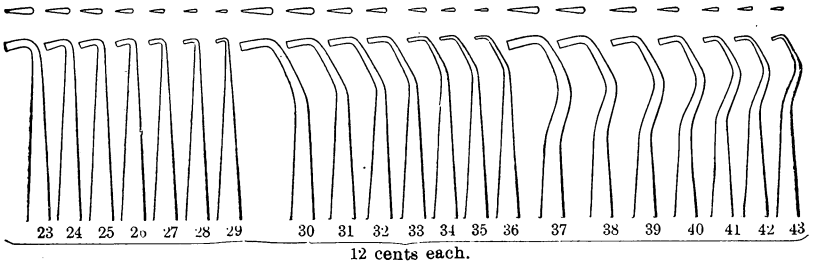
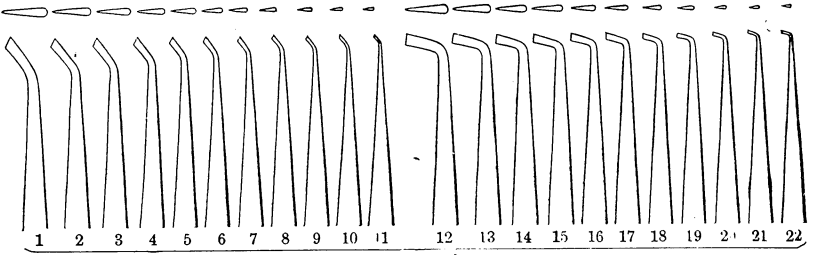
Sold by WELCH DENTAL COMPANY.

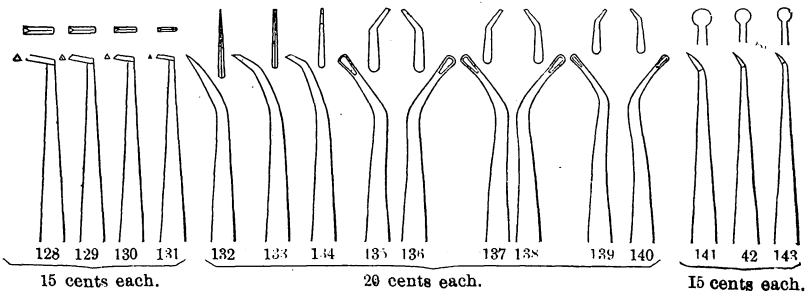
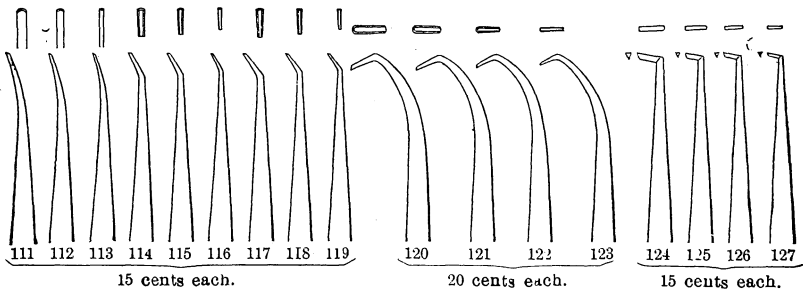
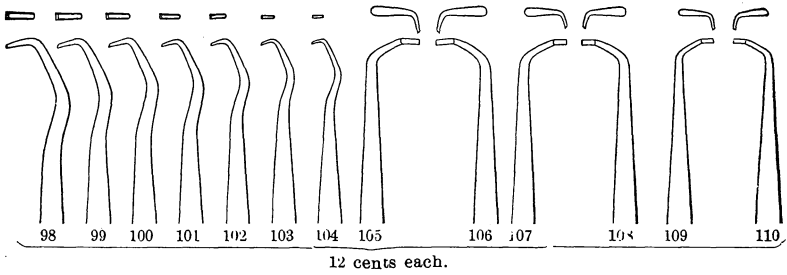
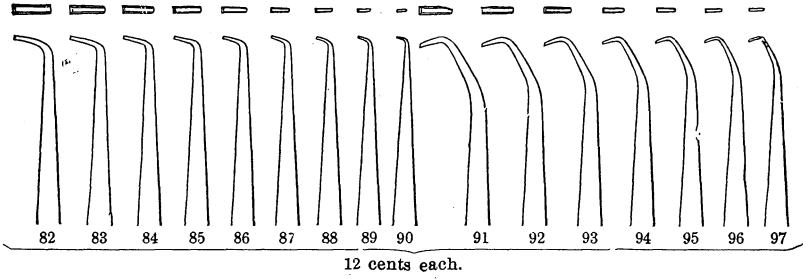
NEW LIST OF CONE-SOCKET EXCAVATORS,

Sold by **WELCH DENTAL COMPANY.**

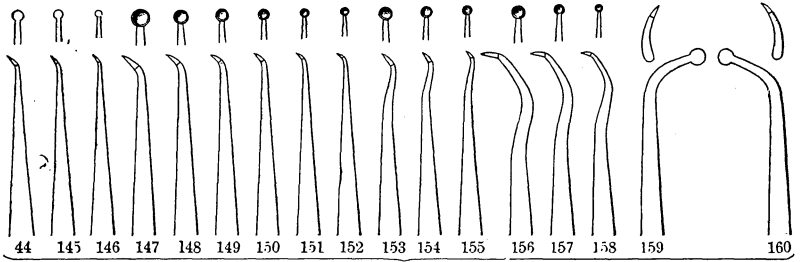
These are the S. S. WHITE DENTAL MANUF'G CO'S CUTS.

All our Cone-Socket Instruments are of their manufacture.

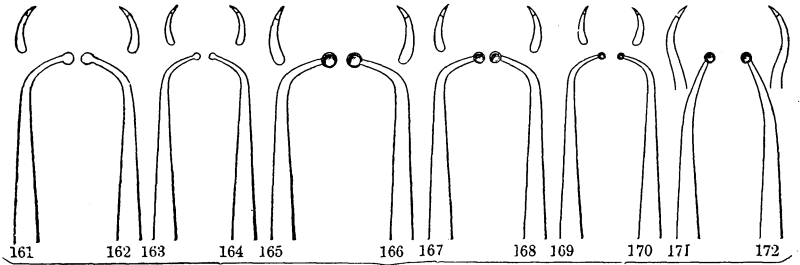


CONE-SOCKET EXCAVATORS.

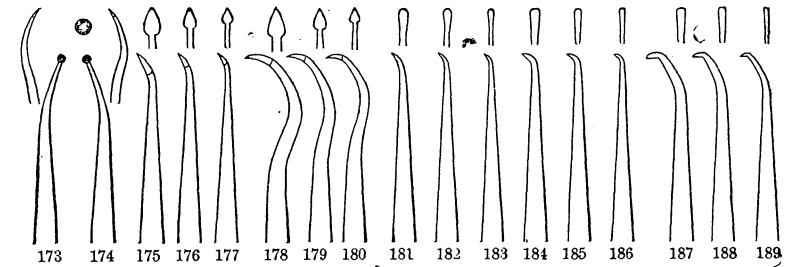
CONE-SOCKET EXCAVATORS.



15 cents each.

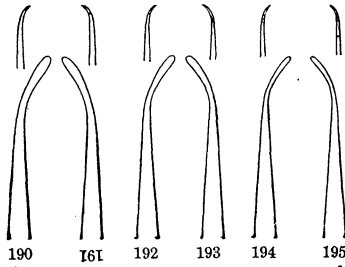


15 cents each.



15 cents each.

20 cents each.

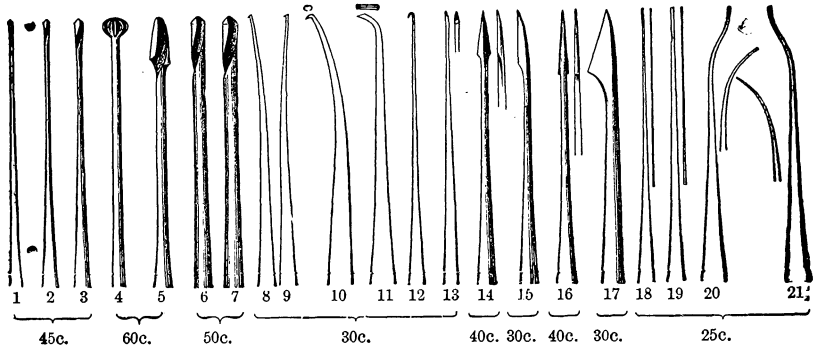


20 cents each.

NEW LIST. CONE-SOCKET NERVE INSTRUMENTS.

Dr. Corydon Palmer's.

How's. Hunter's.



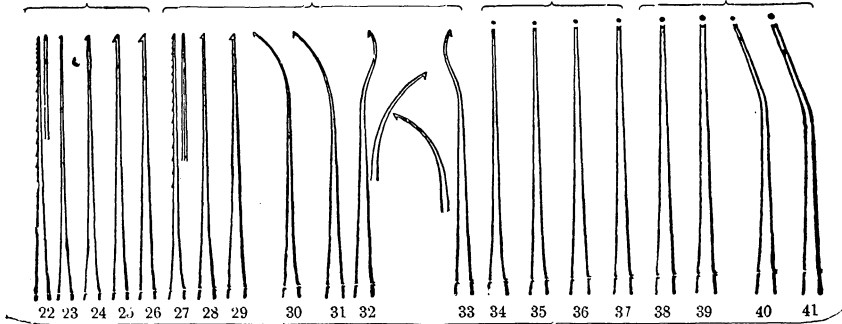
Dr. B. F. Arrington's Extractors and Pluggers.

Soft.

Spring-temper.

Soft.

Spring-temper.



25 Cents.

Dr. Arrington's
(Continued.)

Gates's Drills.

Flexible or Inflexible

Gates-Glidden Drills.

Flexible or Inflexible

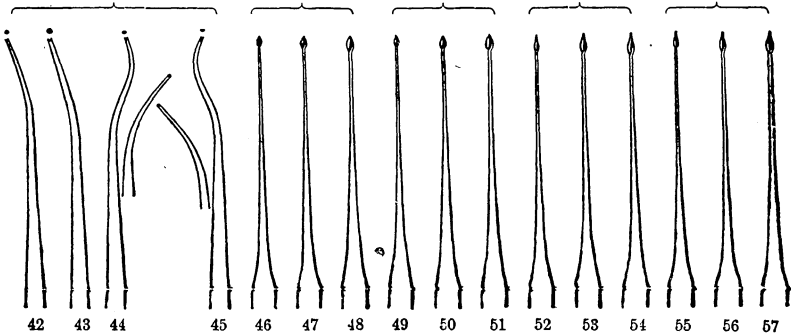
Spring-temper.

Drawn temper.

Spring-temper.

Drawn-temper.

Spring-temper.

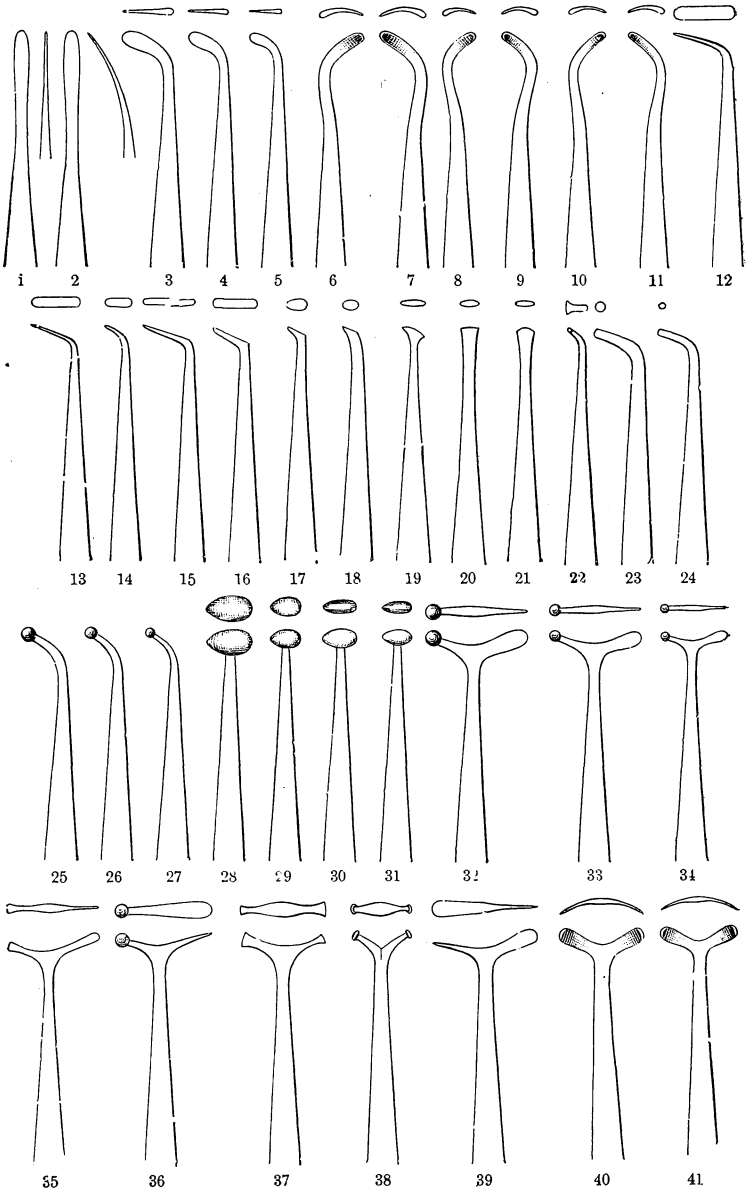


25 Cents.

40 Cents.

BURNISHERS.—NEW LIST.

IN ORDERING PLEASE SAY "NEW LIST."



Price, Nos. 1 to 31, for Cone-Socket Handles,	each 35 cents
" " 32 to 41, "	" 45 "
" " 2 to 31, $\frac{1}{4}$ inch File Cut Handles,	" 50 "
" " 32 to 41, "	" 60 "

(631)

Mouth Mirrors

LONG HANDLES.

- Ebony Handle, Plain, \$1 00
 Ebony Handle, Magnifying.....\$1 50
 Ivory Handle, Plain, \$1 50
 Ivory Handle, Magnifying.....\$2 00

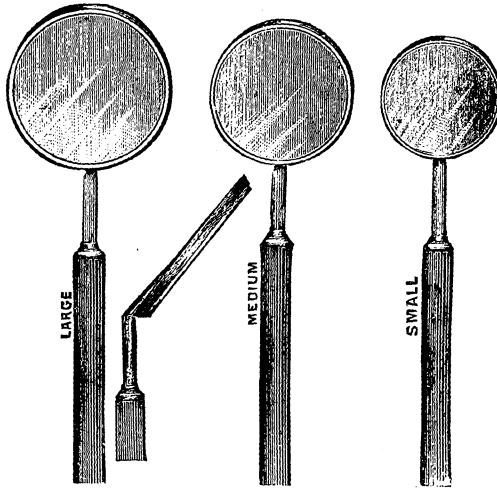
—): (—

Ball and Socket Mirror.

Magnifying Glass....\$2 00

—): (—

Rosewood Mirrors, 25 cts.



GUM LANCETS.

LONG HANDLES.

- Ebony Handle.....50 cts.
 Ivory Handle.....75 "

—): (—

POCKET LANCETS

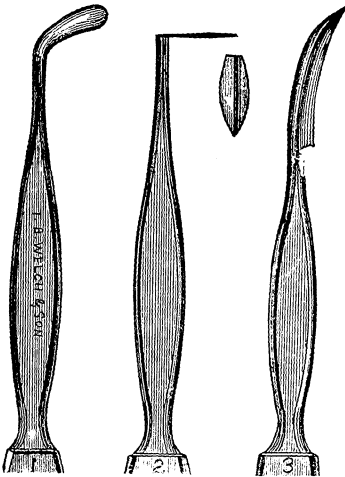
SHELL HANDLE.

- 1 Blade.....\$1 00
 1 " with stop or spring..... 1 50
 2 " " " 2 50
 3 " " " 3 50

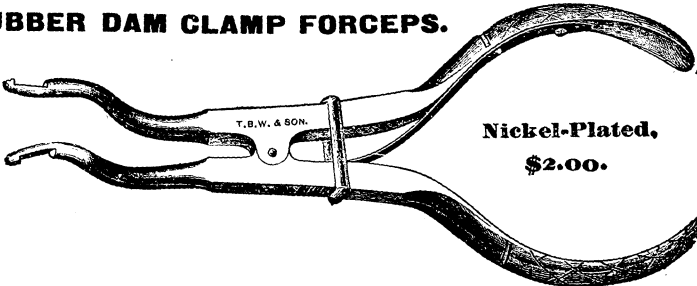
—): (—

RUBBER HANDLE.

- 1 Blade.....75 cts



RUBBER DAM CLAMP FORCEPS.



Nickel-Plated,
 \$2.00.

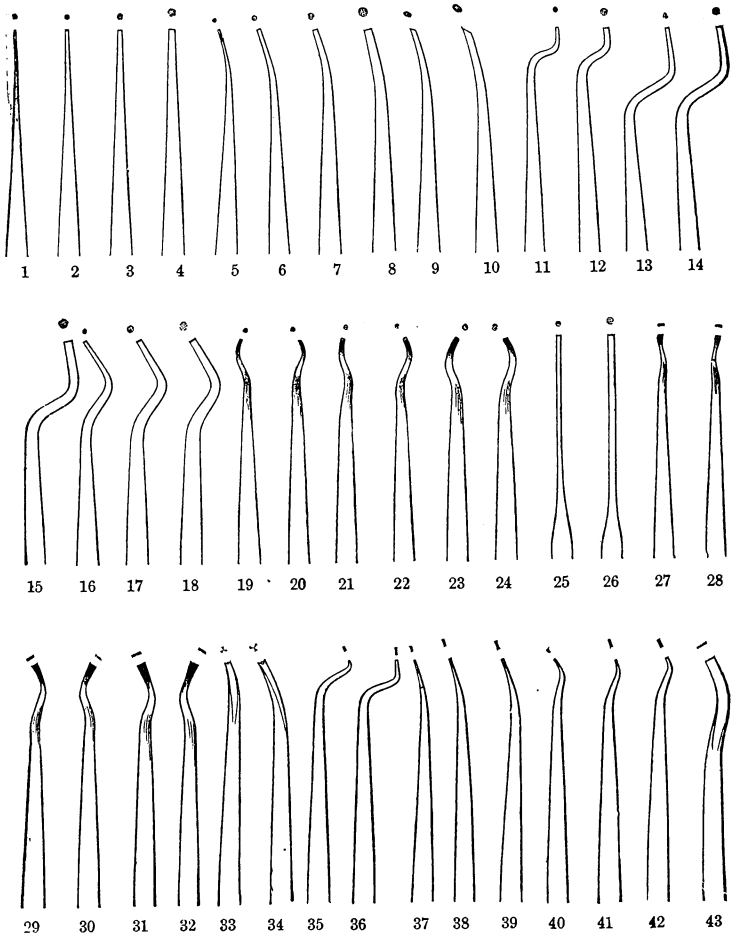
AUTOMATIC MALLET.

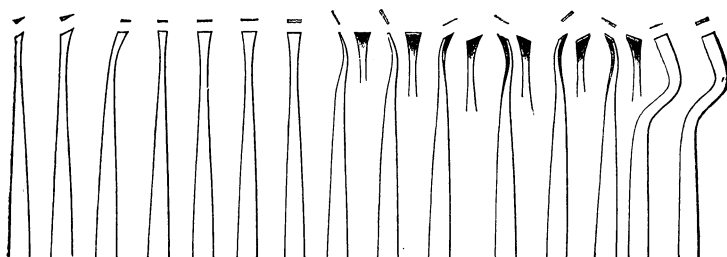
Snow & Lewis Automatic Mallet, nickelplated	\$9.00
Salmon Automatic Mallet, nickelplated	8.00

AUTOMATIC PLUGGER POINT.

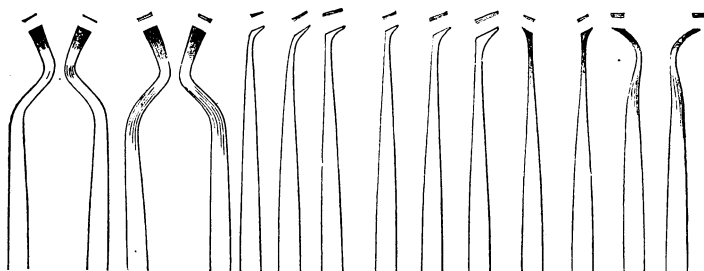
✱ In the following one hundred points, the most valuable forms will be found. They are very carefully made, serrations being of medium depth and very fine. We carry all these forms in stock and will make to order any points desired.

Price, 30 cents each; \$3.50 per dozen.

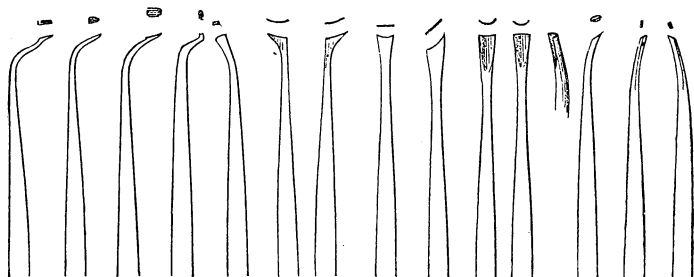


AUTOMATIC POINTS.—*Continued.*

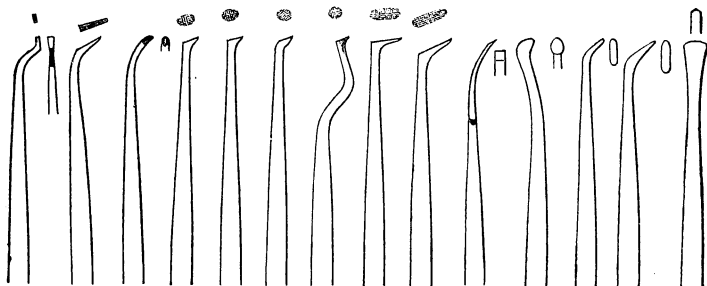
44 45 46 47 48 49 50 51 52 53 54 55 56 57 58



59 60 61 62 63 64 65 66 67 68 69 70 71 72



73 74 75 76 77 78 79 80 81 82 83 84 85 86

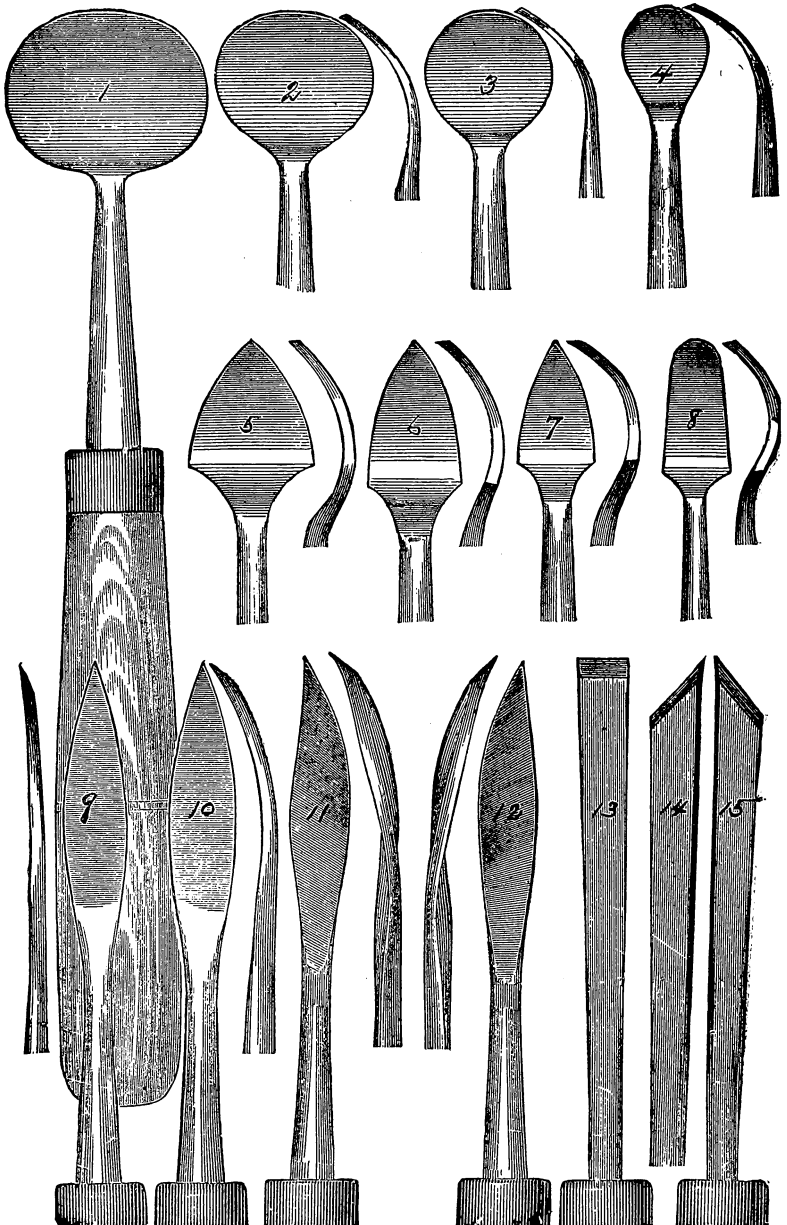


87 88 89 90 91 92 93 94 95 96 97 98 99 100

(634)

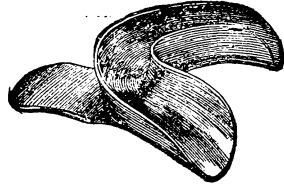
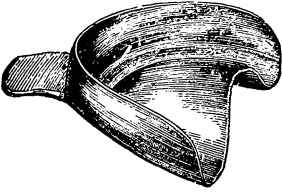
RUBBER SCRAPERS,

25 CENTS EACH.



IMPRESSION CUPS, LONG HANDLES.

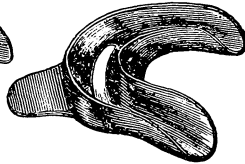
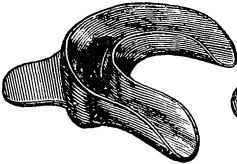
PRICE 25 CENTS EACH.



UPPER, Nos. 0, 1, 2, 3, 4, 5, 6, 7.—No. 0 is the Largest.

LOWER, Nos. 1, 2, 3, 4, 5. —No. 1 is the Largest.

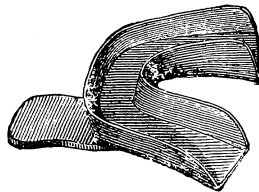
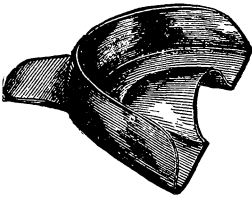
PARTIAL LOWER CUPS.



OPEN CAVITY, No. 6, 7, 8, —No. 6 is the Largest.

ENCLOSED CAVITY, Nos. 9, 10, 11.—No. 9 is the Largest.

FLAT BOTTOM CUPS.



PARTIAL UPPER—FLAT BOTTOM, Nos. 8, 9, 10, 11.—No. 8 is the Largest.

FULL LOWER “ “ Nos. 12, 13, 14.—No. 12 is the Largest.

FRENCH'S PLASTER.

By freight add 25 cents for cartage.

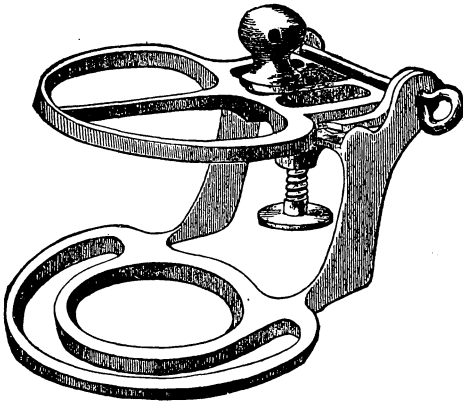
8-quart can,	\$.90
12 “ “	1.15
16 “ “	1.40
Quarter barrel,	1.60
Half “	2.50
One “	3.50

WAX PREPARATIONS.

White Wax for Impression, ½ lb.	.60
Yellow “ “ “ “	.38
Pink Paraffine & Wax for Imp.	.50
Gutta Percha “ “ “ “	.50
Yellow Wax for Base Plates	.50
Pink Paraffine & Wax “	.65
Gutta Percha “ “ “	.50
Modeling Composition “	.63

CORUNDUM WHEELS.

No.	Diameter.	$\frac{1}{4}$ inch Thick.	$\frac{3}{8}$ inch Thick.	$\frac{1}{2}$ inch Thick.	$\frac{5}{8}$ inch Thick.	$\frac{3}{4}$ inch Thick.	1 inch Thick.
00	$\frac{3}{4}$ inch.	\$0.06					
0	$\frac{7}{8}$ "	.07					
1	1 "	.10	\$0.12	\$0.15	\$0.17	\$0.20	\$0.30
2	$1\frac{1}{8}$ "	.14	.15	.17	.20	.25	.35
3	$1\frac{3}{8}$ "	.18	.20	.25	.30	.35	.40
4	$1\frac{1}{2}$ "	.22	.25	.30	.35	.40	.50
5	$1\frac{3}{4}$ "	.26	.30	.40	.45	.50	.60
6	$2\frac{1}{2}$ "	.35	.45	.50	.60	.70	.85
7	$3\frac{1}{8}$ "	.50	.60	.70	.85	1.00	1.30
8	4 "	.85	1.10	1.30	1.50	1.75	2.25



The Standard Articulator.

The capacity of this Articulator is all that is necessary. It will take single or double models, and admit of any change in articulation. Entirely of Brass, nicely fitted, finely polished nickel-plated.

Price, \$1.50, Post-paid.
Not Nickelplated, \$1.00.

IDEAL TOOTH POWDER. ❁

IDEAL TOOTH POWDER was awarded a Gold Medal for quality and display above all competitors at the World's Exposition, New Orleans, La. It has a large and increasing sale, and is receiving the endorsement of the Profession wherever introduced. Our endeavor is to meet the requirements of a perfect dentrifice, and it is in every respect as near that standard as we know how to make it. Samples and price-list sent to any address, postage paid.



VAIL BROTHERS,

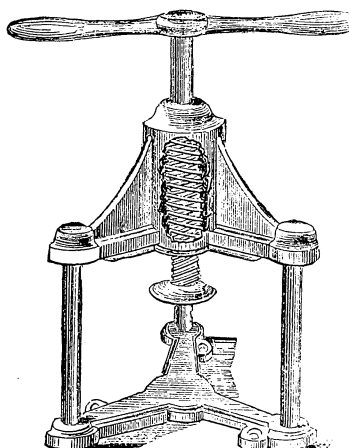
239 MARKET STREET, - PHILADELPHIA.

ENGLISH PINK RUBBER.

No. 1 X REDUCED TO \$6.00 PER $\frac{1}{2}$ LB.

Trade Supplied by **WELCH DENTAL CO.**

WELCH'S AUTOMATIC PRESS.



With this Press teeth are not broken, blocks are not pressed out of place, rubber is not worked in the joints, and much time and attention is saved. The screw operates on a strong steel spring, and the spring acts on the flask with a steady but firm pressure.

DIRECTIONS FOR USING :

Place the flask as in an ordinary press, and turn the screw till pressure begins—(with ordinary clamp or press you would now have to heat, and wait a while, then turn very carefully, then heat again, and so repeat several times), but with WELCH'S AUTOMATIC turn the screw six or eight times after pressure begins, place the flask and press in boiling water, and, without further attention, the flask will be closed. Too great an excess of rubber, may require extra pressure.

PRICE, \$3.00.

WELCH DENTAL COMPANY, PHILA.

YOU WILL

MAKE NO MISTAKE

IN SENDING US REPAIRING.

Our department for that line of work has the same skill and attention as New Manufactures.

PART PRICE LIST.

Excavators and Engine Burs,	-	-	-	Per Dozen,	\$.75
Engine Burs Repaired and Honed,	-	-	-	" "	1.50
Varney and Other Fine Pluggers,	-	-	-	" "	2.50 3.00
Pluggers, Ordinary,-	-	-	-	" "	1.50
FORCEPS, Repaired and N. P.,	-	-	-	each,	.6

LUKENS & WHITTINGTON,

DENTAL INSTRUMENT MANUFACTURERS,

626 Race Street.

PHILADELPHIA, PA.

SAMSON RUBBER.



PRICES.

	<i>Per Pound.</i>	<i>Per Pound.</i>
SAMSON RUBBER	\$2.75	<i>Gutta Percha for base plates, \$2.25</i>
<i>No. 1 Rubber</i>	<i>2.25</i>	<i>Weighted or Amalgamated</i>
<i>No. 2 Rubber</i>	<i>2.25</i>	<i>Rubber, in pound or half-</i>
<i>Black Rubber,</i>	<i>\$2.25</i>	<i>pound boxes, 4.00</i>

Under the above name is offered to the Dental profession a rubber which for strength, lightness and durability EXCELS ANY HERETOFORE MANUFACTURED. It is claimed for this rubber that by a new process to which the composition is subjected, improves the quality and prevents it, to a great extent, from being porous; it also prevents the composition from showing on the surface after the rubber has been vulcanized and polished, as is the case with other rubber.

This rubber is made of the Para gum carefully selected and purified, and manufactured by a new process, and is thoroughly free from injurious substances. Each pound contains on an average twenty sheets. It has three times the strength of ordinary rubber; it packs easily; and for lightness and fine finish, it is guaranteed to be superior to any rubber in the market. We commend it to all who wish to use rubber as a base for artificial dentures.

Patented June 3, 1879.

WEIGHTED RUBBER.

To the Dental Profession :

What is claimed for this rubber is its weight, strength and solidity; it takes the place of all metals now in use as base for lower plates, (not excepting continuous gum work). It is a non-elastic substance, superior to all other rubbers now in use. It does not contract or expand, thus avoiding the breaking or checking of blocks after being vulcanized or during the process of cooling. It packs much easier than any rubber now in the market. There is no danger of this rubber becoming porous, as is the case with other rubbers where extra thick plates are required. It vulcanizes the same as ordinary rubber.

We manufacture two kinds; No. 1 for lower plates, and No. 2, which corresponds in color and appearance with No. 1, is used for upper plates.

All pure metals can be introduced by our method, and will be manufactured to order only.

This rubber has been in use for over two years and has given entire satisfaction.

Address all orders to

EUGENE DOHERTY,

444 FIRST STREET, BROOKLYN. E. D. N. Y.

LINE YOUR RUBBER PLATES

WITH

Vulcanizable Gold !!

This Gold is warranted not to **peel off or separate** from the Rubber. Any dentist who can make a rubber plate can readily apply it. No extra apparatus needed. Full directions with each book. One book will cover a large upper plate, or two lower plates.

PRICE, \$3.75 PER BOOK.

By the use of this Gold all objections to Rubber as a base for artificial teeth are obviated, as it prevents all irritation and poisoning of the tissues of the mouth, and makes a beautiful plate, and one that is easily kept clean. Dentists can

Readily obtain from \$10 to \$20 extra

for a set of teeth lined with this Gold. Endorsed by some of the best dentists in the profession. Sent to any address upon receipt of price, \$3.75 per book.

ALL DEALERS KEEP IT.

—READ SOME OF THE TESTIMONIALS:—

Dr. J. A. Robinson, of Jackson, Mich., manufacturer of Fibrous and Textile Filling for Teeth, says: "I consider it a good thing and a great advance over any thing given to the dental profession."

Dr. W. C. Barrett, of Buffalo, N. Y., writes: "There is no doubt that it makes a great advance; am satisfied it is a good thing and that there is no danger of its separating from the rubber."

D. J. Lathrop, of Detroit, Mich., writes July 27, 1885: "I have used Vulcanizable Gold with great satisfaction and my patients seem well pleased with the result. Having used it in 12 or 15 cases and every one feels that it is much pleasanter in the mouth than the old rubber plates without the lining."

Dr. Magnuss, of Chicago, Ill., says: "The more I use your Gold the better I like it. I make no plates without it."

Dr. W. H. Cornell, Grand Rapids, Mich., says: "Have used Vulcanizable Gold for six months and can heartily recommend it to all. It will not corrode, tarnish nor peel off, it is easily applied and makes a beautiful plate, and the great benefit it gives the patient who wears it ought to bring it into general use. I readily get \$10 extra for a gold lined plate."

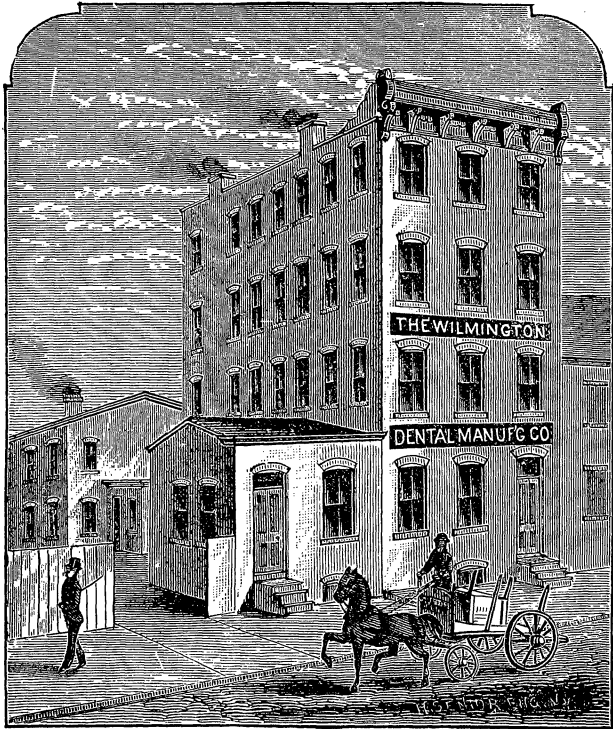
C. W. McNaughton, D. D. S., of Grand Rapids, Mich., says: "Having tested your Vulcanizable Gold in several cases in which rubber was proving injurious, and noting the satisfactory results following the use of the Gold, I shall make it a point hereafter introducing the same to my patients."

S. S. WHITE DENTAL MFG. CO.,

SOLE AGENTS.

The Wilmington Dental Manufacturing Co.,
MANUFACTURERS OF SUPERIOR

ARTIFICIAL TEETH.



Appreciating the great assistance that manufacturers can render the practitioner in Prosthetic Dentistry, by careful observation of nature's fixed laws, governing and harmonizing the constitutional organization of man, and intelligently APPLYING THESE LAWS,

THE WILMINGTON DENTAL MANUFACTURING Co., in the manufacture of their

SUPERIOR ARTIFICIAL TEETH.

have directed careful and studied attention to the vital points determining the character of *Dentures* in their relation to *Temperament Characteristics*, and observing the uniform law of correspondence, aim to produce in character of mould, *shading* and *texture* of *tooth*, the nearest approach possible to harmony.

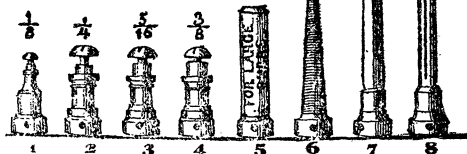
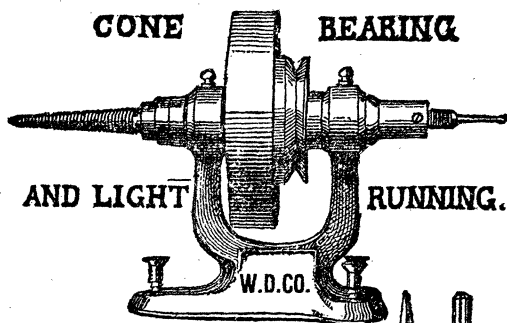
We solicit the attention of the Dental Profession and a share of their patronage. Send for samples and full information.

THE WILMINGTON DENTAL MANF'G Co.,
Wilmington, Del.

LATHE HEAD NO. 5.

CONE BEARING

With Ten Chucks,
Price \$8.50.



This Lathe Head, with heavy balance wheel on the spindle, is very positive in its movement, and is remarkably easy and light running.

It has 10 useful chucks. Nos. 1, 2, 3 and 4 are for Corundum wheels of any size and thickness. No. 5 is for large lathe burs; No. 6 and the chuck (No. 9) at left on the lathe are right and left screw cones for brush wheels, &c.; No. 7 is square in shape, and is for corks, &c.; No. 8 is for sand-paper; No. 10 is a place in the right of the lathe head for carrying engine burs, drills &c.—a very convenient and useful addition.

TRADE SUPPLIED.

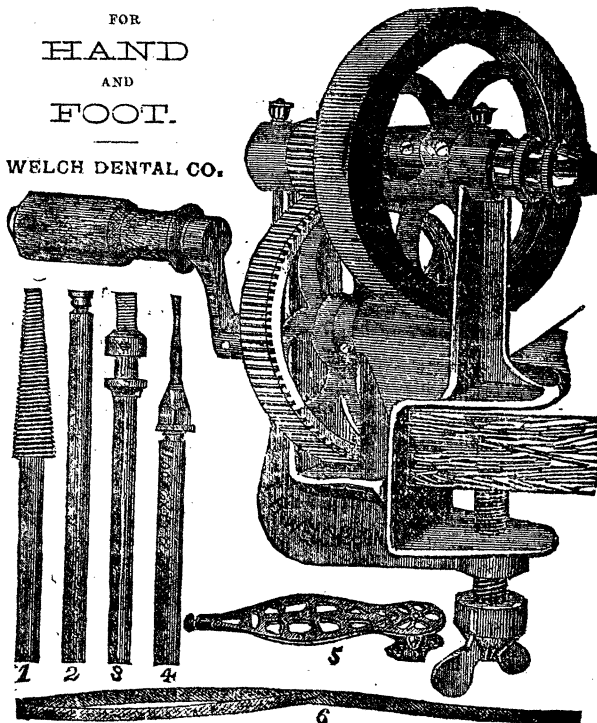
WELCH DENTAL CO.

CONE JOURNAL LATHE AND CHUCKS.

This Lathe is a decided improvement on anything in the shape of Portable Lathes. It has Cone Journal bearings and the wear is readily taken up. The capacity of this Lathe is very great—the cogs and wheels are so arranged that the greatest amount of power is obtained. The three mandrels that are supplied with each Lathe are capable of holding the necessary Brush wheels, Corundum wheels, etc. The No. 4 Mandrel, (price, \$1.00) is a small Universal Chuck for holding all Dental Engine Drills, Burs, etc. **Price, \$7.00.** Trade Supplied.

FOR
HAND
AND
FOOT.

WELCH DENTAL CO.



WELCH MAROON RUBBER, NON-MERCURIAL.

NO MERCURY, EASILY PACKED, NEVER POROUS, GREAT STRENGTH, VERY ELASTIC, BEAUTIFUL FINISH.

▼ The presence of Mercury has been the most prominent objection to Rubber as a base for Artificial Teeth, ever since its introduction to the profession. At last, by a new and expensive manipulation, and much experimenting and labor, we have a Vulcanite *free from Mercury*,—and what is just as much a cause for congratulation, we have, at the same time, increased its plasticity, elasticity and strength, and have rendered it less likely to become porous when vulcanizing.

WELCH MAROON RUBBER.—\$3.00 lb.; \$1.50 ½ lb.; 75 cts. ¼ lb.
JET-BLACK RUBBER.—\$3.00 lb.; \$1.50 ½ lb.; 75 cts. ¼ lb.
BROWN RUBBER.—\$2.30 lb.; \$1.50 ½ lb.; Postage, ext., 20c. per lb.
No. 2 or RED RUBBER.—\$2.25 lb.; \$1.13 ½ lb.; 58 cts. ¼ lb.

Single Sheet of any Welsh Rubber 20 cents.

FULL DIRECTIONS IN EVERY BOX OF RUBBER.

Welch's Gutta Percha for Base Plates.—½ lb, \$1.13; 1 lb, \$2.25.

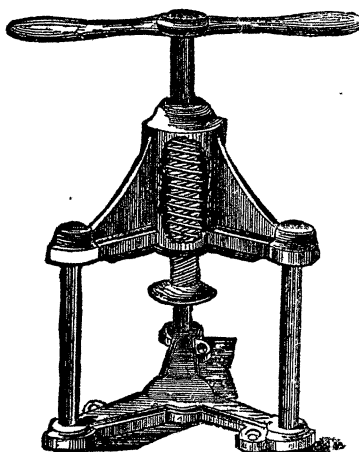
Samson Rubber.....per lb.....	\$2 75	Bow Spring Rubber, per lb.....	\$2 75
Doherty, No. 1, Rubber "	2 25	Poulson's Pink " "	5 50
Doherty, No. 2, " "	2 25	English " " "	7 00
Weighted Rubber..... "	2 40	English Black " "	3 00

EXTRA RUBBER DAM.

This Rubber Dam is good when bought; will give satisfaction in use, and will keep good.

Price, Medium, \$1.50 per yard.

WELCH'S AUTOMATIC PRESS.



With this Press teeth are not broken, blocks are not pressed out of place, rubber is not worked in the joints, and much time and attention is saved. The screw operates on a strong steel spring, and the spring acts on the flask with a steady but firm pressure.

DIRECTIONS FOR USING :

Place the flask as in an ordinary press, and turn the screw till pressure begins—(with ordinary clamp or press you would now have to heat, and wait a while, then turn very carefully, then heat again, and so repeat several times), but with **WELCH'S AUTOMATIC** turn the screw six or eight times after pressure begins, place the flask and press in boiling water, and, without further attention, the flask will be closed. Too great an excess of rubber, may require extra pressure.

PRICE, \$3.00.

WELCH DENTAL COMPANY, PHILA.

